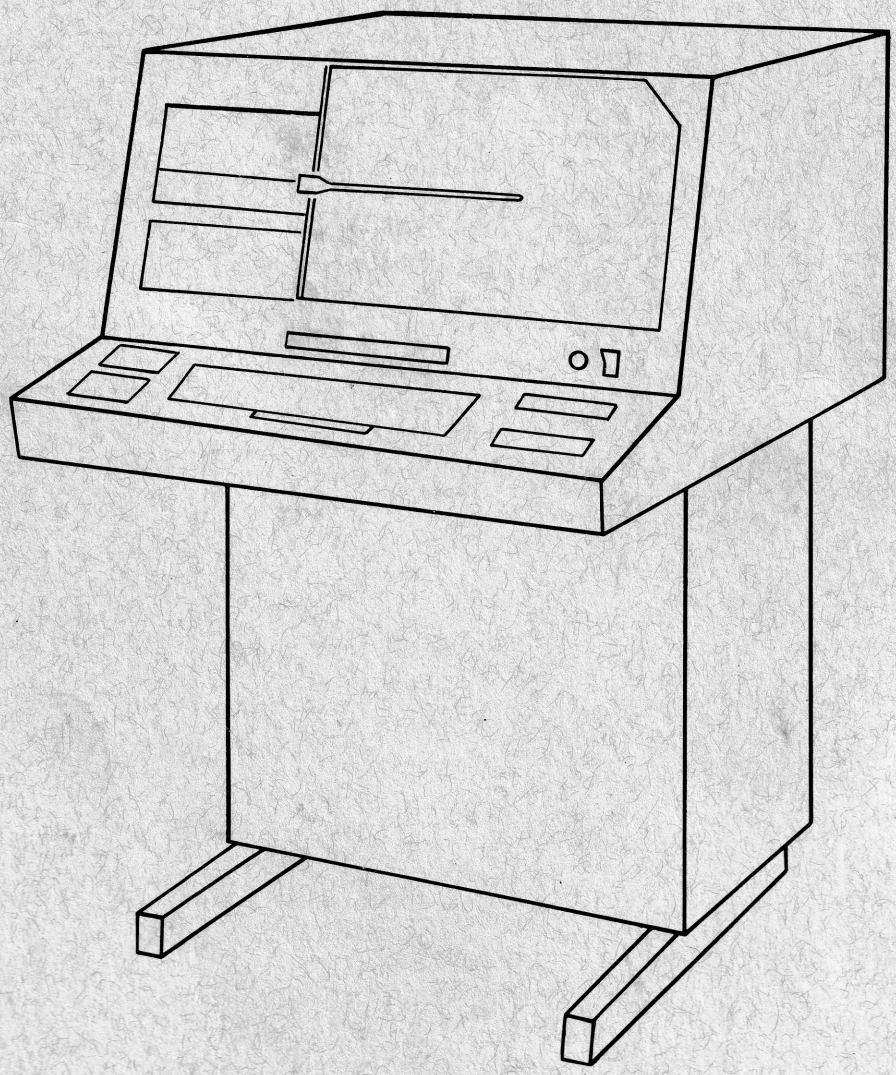
COMPUWRITER IV/UNIVERSAL IV

SERIES (IV, 48, 88)

(Serial Numbers 2000 and Above)

CUSTOMERS MAINTENANCE MANUAL



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36673-001

COMPUWRITER IV/UNIVERSAL IV

SERIES IV, 48, 88

(Serial Numbers 2000 and Above)

CUSTOMERS
MAINTENANCE
MANUAL

Field Service Publications
36673-001 REV 2
March 1977

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PARTS ORDER FORM (325-478)
INSTALLATION CHECKLIST (325-333)
PREVENTIVE MAINTENANCE STICKER (325-325)

SECTION I
INTRODUCTION

1.1 DESCRIPTION

Each model of this series is a direct-input system, containing a lens turret for various point sizes, and two Film Strips to provide up to eight faces. Refer to Table 1-1 for variations between models.

Table 1-1 Variations between Models

MODEL	MIXING IN LINE	POINT SIZES LOW RANGE	POINT SIZES HIGH RANGE	FONT CAPACITY
IV	8 Faces, 12 Sizes	6, 7, 8, 9, 10, 11, 12, 14, 18, 24, 30, 36	6, 8, 10, 12, 14, 18, 24, 30, 36, 48, 60, 72	Eight Faces (Two Film Strips, Four Faces Each)
88	8 Faces, 8 Sizes	6, 8, 9, 10, 11 12, 18, 24	6, 8, 10, 12, 18, 24, 36, 48	Eight Faces (Two Film Strips, Four Faces Each)
48	4 Faces 8 Sizes	6, 8, 9, 10, 11, 12, 18, 24	6, 8, 10, 12, 18, 24, 36, 48	Four Faces (Two Film Strips, Two Faces Each)

Refer to Figure 1-1. The keyboard sends the codes to the Logic, and the Character Display indicates the characters, spaces and functions as they are keyed. The Line Measure Display counts down as the width values are calculated. If tabular columns are set, the Tab Display indicates which tab is active. Each line to be set is sent to the Photo Unit, where the characters on the Film Strip are projected through the lens system onto the photographic paper. The paper is advanced into the cassette at the completion of each line. At the end of a take, the paper is advanced into the cassette several inches and removed from the machine for chemical processing. The result is right-reading output copy on photographic paper. For a more detailed functional description, see Paragraph 1.5.

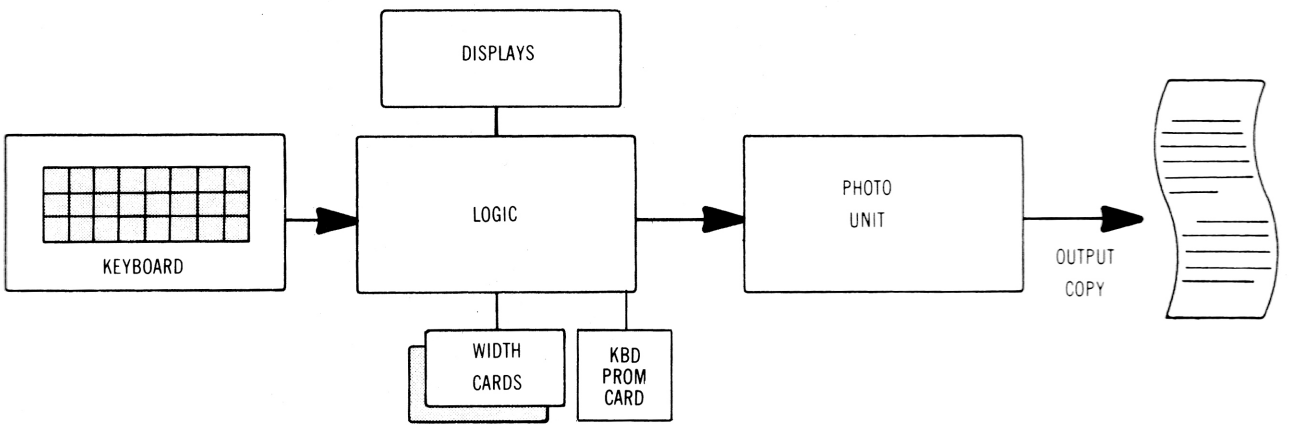


Figure 1-1 Basic System Concept

Table 1-2 Specifications

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Input:	Direct entry (keyboard)	**Line Ending:**	Automatic or operator controlled
Speed:	Operator controlled	**Quadding:**	Left, Center, Right
Line Measure:	Any line length to 45 picas	**Insert Space:**	Unlimited number of insertions per line
Type Sizes:	See Table 1-1		
Type Unit System:	54 Units to the em	**Insert Rule:**	One insertion per line
Characters per font:	118 (16 Super Shift characters)	**Insert Leaders:**	One insertion per line
Font Capacity:	See Table 1-1	**Paper:**	Type S paper, 2", 3", 4", 6", 8" wide
Mixing:	See Table 1-1	**Cancel Functions:**	Character, word, line; operator controlled
Tabbing:	10 tab positions for multiple justification	**Displays:**	(1) 32 Character Display (2) Line Measure Display (3) Tab indication
Leading:	0-127½ points in ½ point increments (switch or keyboard controlled)	**Depth:**	32" (81.3 cm)
Kerning:	In points or units; operator controlled	**Width:**	29" (73.7 cm)
Letterspace Control:	Operator controlled; panel or keyboard	**Height:**	42" (96.7 cm)
Character Compensation:	Operator controlled; panel or keyboard	**Weight:**	450 lbs.
Justification:	Automatic; flush right or ragged right	**Electrical Requirements:**	*See below
Hyphenation:	Automatic and Discretionary	**Environment:**	See Paragraph 1.13

*115 VAC, 60Hz; 115 VAC, 50 Hz; 230 VAC, 60 Hz; 230 VAC, 50 Hz (depending on model purchased). See voltage and frequency stamped on Power Supply chassis near line fuse. See photo Figure 5-1.

1.3 SYSTEM CONFIGURATION (Figures 1-2 thru 1-7)

This system is comprised of the major assemblies shown in the following photographs:

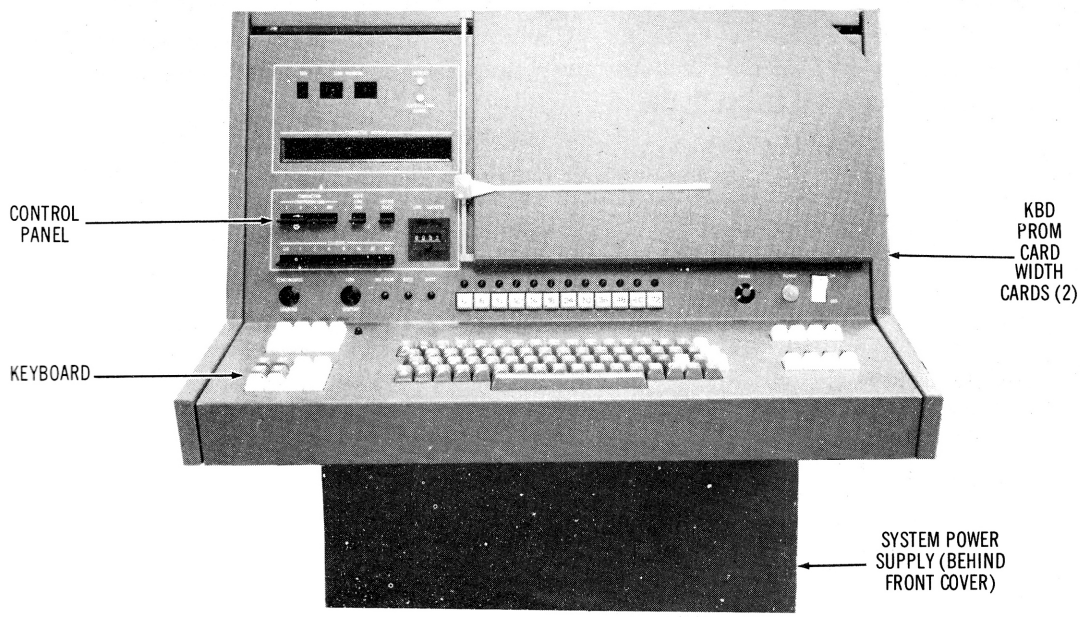


Figure 1-2 Front View of System

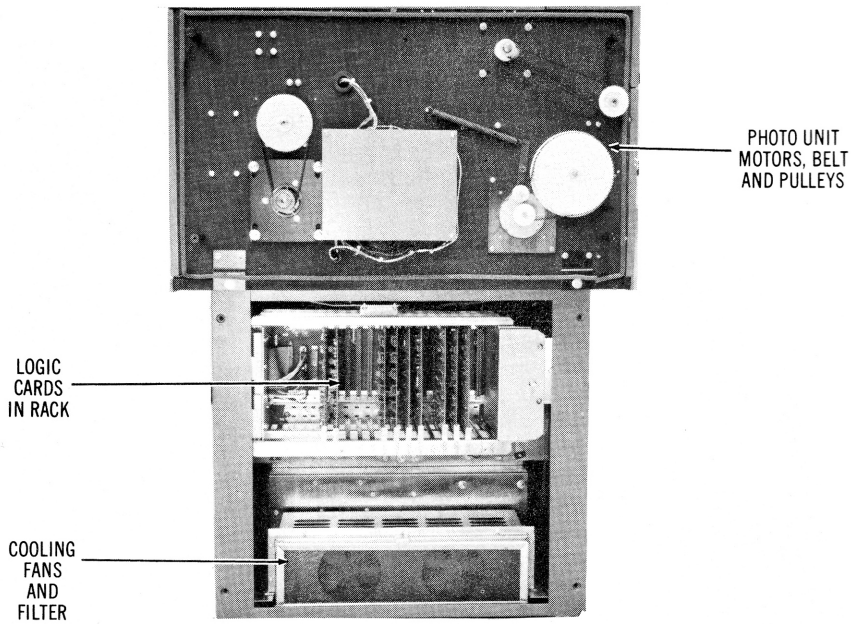


Figure 1-3 Rear View of System with Covers Removed

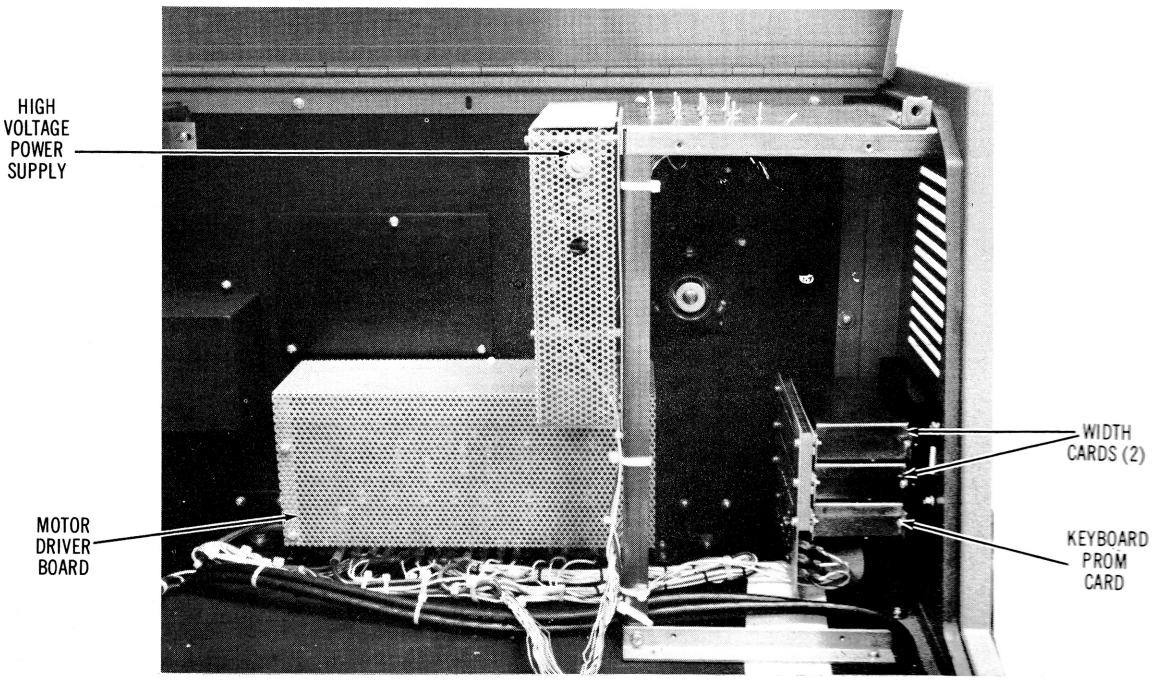


Figure 1-4 View of Assemblies Behind Control Panel

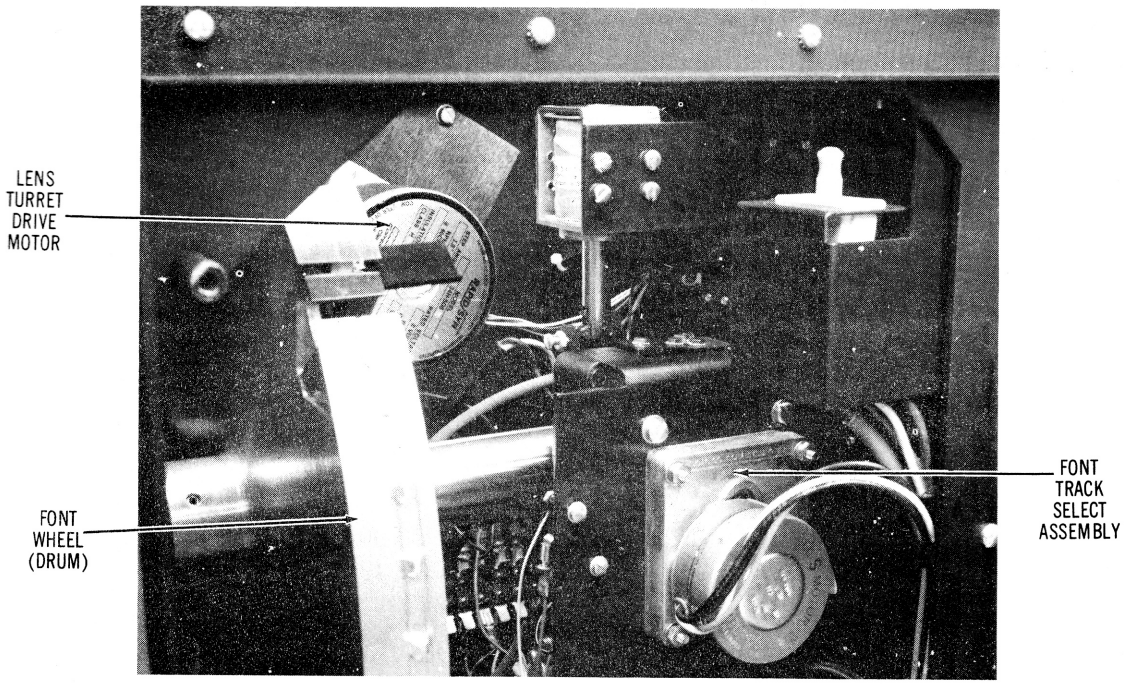


Figure 1-5 View Inside Font Chamber (with Safety Covers Removed)

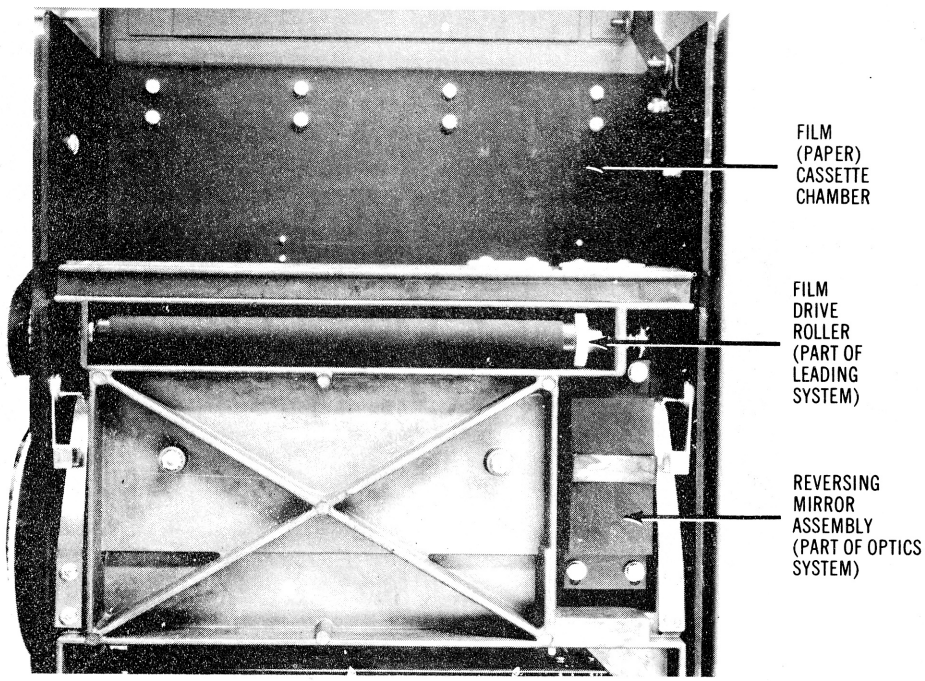


Figure 1-6 View Inside Film Chamber

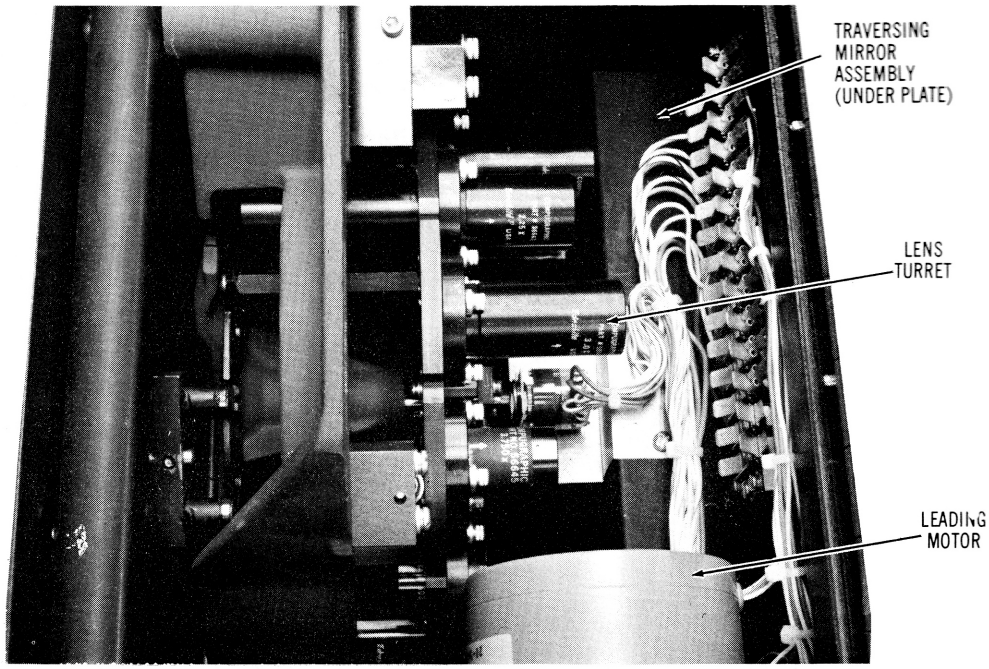


Figure 1-7 View Inside Lens Turret Chamber

1.4 CONTROLS AND INDICATORS

The basic functions of the front panel controls, lamps, displays and important keyboard functions are summarized in the following tables (See Tables 1-3 thru 1-10). Refer to the appropriate figures for identification. Consult the Applications Manual for detailed descriptions of the functions and their applications in typesetting.

Table 1-3 Control Panel Left Side (Figure 1-8)

ITEM	DESCRIPTION/FUNCTION
TAB Display	Indicates which TAB is in use (1 through 10).
LINE MEASURE Display	Displays measure in Picas and Points, Cicero and Points or Millimeters.
OVERSET Lamp	Indicates that width in line exceeds measure.
JUSTIFICATION RANGE Lamp	Inidcates that spaceband expension can justify measure.
CHARACTER DISPLAY	Displays characters, spaces and functions as they are keyed.
CHAR. COMPENSATION Switches	Reduces spacing between characters by a mount selected when on.
ON Switch	Switch up—allows selected Composition value. Switch down—disables all Character Compensation.
AUTO LINE END Switch	Switch up—allows Automatic Justification of the measure.
LETTER SPACE Switch	Allows expansion of character width for justification.
LINE COUNTER	Indicates the number of lines processed. Can be reset to zero.
LEADING Switches	Controls the amount of film advanced for each Return code.
CONTINUOUS LEADING Button	Advances three inches of film for each time pressed.
LINE DISPLAY Button	Initiates parade of last 32 characters of previous line, then displays the line to be processed.
NO FILM Lamp	Indicates that film supply is exhausted by blinking, accompanied by interrupted tone.
BUSY Lamp	Lights when the Photo Unit is active.
SHIFT Lamp	Indicates that upper case is in effect at the keyboard
Point Size Selectors	Keys 6-8-10...72 select the point size indicated.
Point Size Lamps	(Above the keys) Indicate the point size selected.

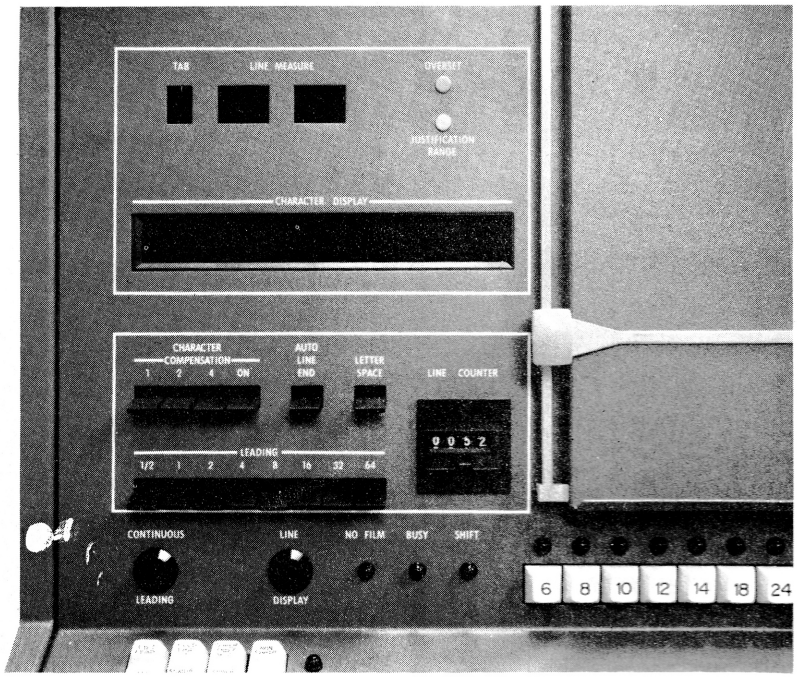


Figure 1-8 Control Panel (Left Side)

Table 1-4 Control Panel — Right Side (Figure 1-9)

ITEM	DESCRIPTION/FUNCTION
POWER Switch (OFF-ON)	Controls the line current to the system.
POWER Lamp	Indicates that system is energized (when lit).
PRIME Button	Initializes the logic.
Track Selector Keys	Select Tracks 1-8 as desired.
Track Indicators	(Above keys) Indicate which track is in use.

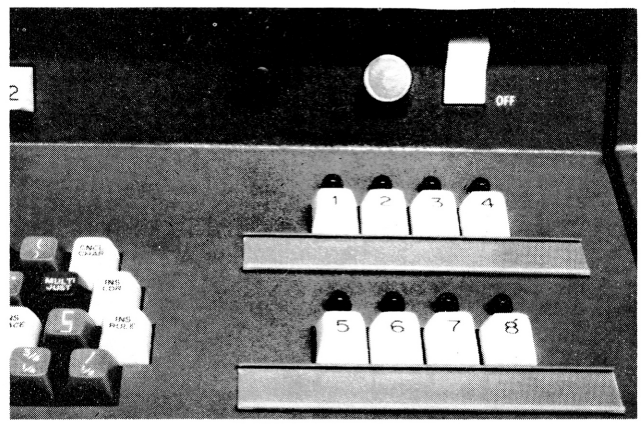


Figure 1-9 Control Panel (Right Side)

Table 1-5 Auxiliary Keyboards (Figure 1-10)

ITEM	DESCRIPTION/FUNCTION
+1 PT. LEAD	Inserted anywhere in line, provides one point of leading.
PLUS LINE SP	Provides amount of leading on switches at point of insertion.
SUPER SHIFT U.C.	Expands use of numeral keys (See Figure 1-13).
NON PHOTO	Allows only the escapement of width. Inhibits flash.
-1 PT. LEAD	Inserted anywhere in line, provides reverse leading of one point.
MINUS LINE SP	Provides reverse leading of value on switches at point of insertion.
SUPER SHIFT L.C.	Expands use of numeral keys (See Figure 1-13).
PHOTO	Cancels NON PHOTO function, restores flash.
CNCL LINE	Cancels all entries back to the previous line ending.
CNCL WORD	Cancels all entries back to the previous spaceband (inclusive).
REPT	Causes repeated entry of character keyed immediately after.
FLASH ONLY	Causes character keyed immediately afterward to have no width value.
FWD ONE PT	Inserted anywhere in line, adds one point of space.
FWD ONE UNIT	Inserted anywhere in line, adds one unit (1/18 em) of space.
LINE MEAS SET	Followed by four digits, enters line measure.
LINE SPACE SET	Used for keying desired leading value.
BACK ONE PT	Inserted anywhere in line, reverse-escapes one point.
BACK ONE UNIT	Inserted anywhere in line, reverse-escapes one unit.
CHAR COMP SET	Used for keying desired intercharacter space reduction.*
CALC LINE	Enables recalculation of line in conjunction with CHAR COMP switches.
CARR RESET	No-Lead Return and exit from Tabbing function.
TAB SET	Followed by four digits, enters one of ten Tabbing measures.
TAB	Restores Tabbing, selects Tab One and its measure.

*Character Compensation switches must all be down, and ON switch must be up.

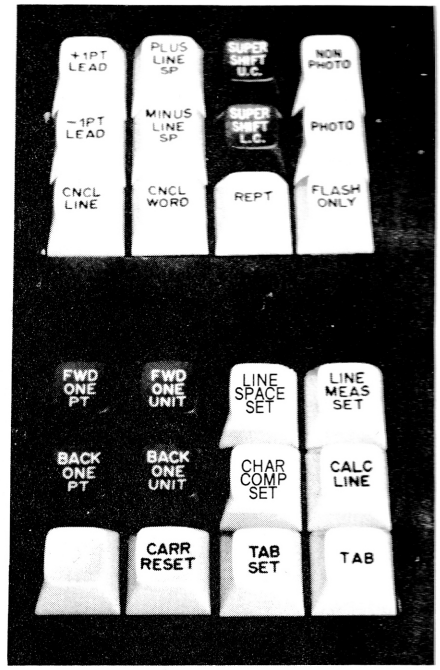


Figure 1-10 Auxiliary Keyboards

Table 1-6 Internal Controls (Figure 1-11)

ITEM	DESCRIPTION/FUNCTION
SB Switches	Minimum allowable spaceband value in 54ths of an Em.
SB EXP Switches	Maximum spaceband value prior to letterspacing
REPT LINE	Allows repeated reproduction of same line on output copy.
REPT FLASH	Allows repeated flashing of same character (no escapement).
JR. AUDIO	Provides signal tone when JR lamp is on (when switch is up).
RAG RIGHT	Switch up—ouptput copy not justified to right margin.
HYPHEN	Switch up—all Hyphenation active; Switch down—Auto-Hyphen disabled.

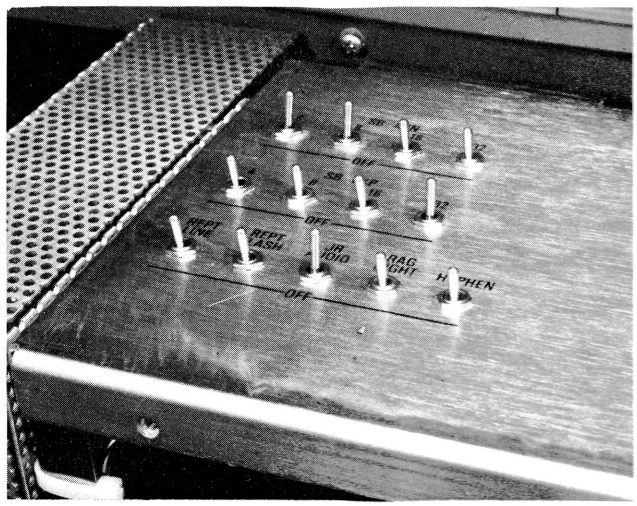


Figure 1-11 Internal Controls

Table 1-8 Basic Keyboard Layout — Type 500 (Figure 1-13 Shaded Keys)

FUNCTION KEY	DESCRIPTION/FUNCTION
QL	Quad Left – Aligns text on left margin but no leading occurs.
EL/TR	End Line–Returns carriage (no leading); Tab Repeat repeats previous tab value when TAB active.
CNCL CHAR	Cancel Character – Cancels last keyboard entry. May be repeated.
QC	Quad Center – Entered just prior to Return, centers text in measure.
THIN	Thin Space – Fixed space value, one-third em.
EN	En Space – Fixed space value, one-half em.
TAB/MJ	Tab increments TAB counter. Multijust ends each TAB "line"; no lead, no return.
INS LDR	Insert Leader – Enters justifying leaders at one point in the line.
QR	Quad Right – Entered just prior to Return, aligns text on right margin.
EM	Em Space – Fixed space value equal to point size selected.
SHIFT LOCK	Enables Upper Case until cancelled by one of two Shift keys.
RET	Return – Line-ending function that returns carriage and enables leading.
INS SP	Insert Space – Enters justifying space wherever inserted in line.
INS RULE	Insert Rule – Enters justifying baseline rule. Inserted once in a line.
SHIFT (1 of 2)	Momentarily enables Upper Case. When released, activitates Lower Case.
DH	Discretionary Hyphen–Establishes potential hyphen location for justification.
WORD SPACE	Enters expandable space value any number of positions in line.

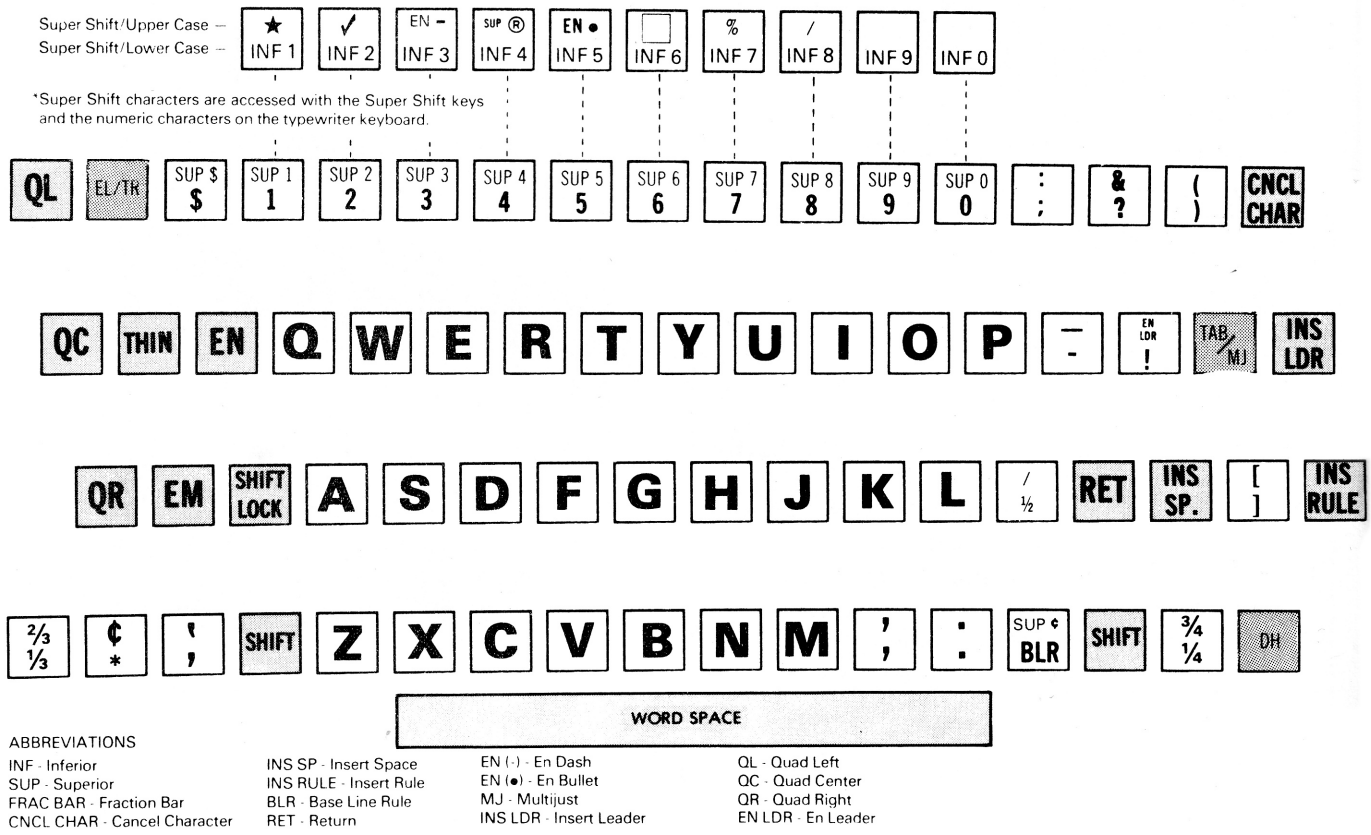

Super Shift/Upper Case –
Super Shift/Lower Case –
*Super Shift characters are accessed with the Super Shift keys and the numeric characters on the typewriter keyboard.
WORD SPACE
ABBREVIATIONS
INF - Inferior
SUP - Superior
FRAC BAR - Fraction Bar
CNCL CHAR - Cancel Character
INS SP - Insert Space
INS RULE - Insert Rule
BLR - Base Line Rule
RET - Return
EN (-) - En Dash
EN (•) - En Bullet
MJ - Multijust
INS LDR - Insert Leader
QL - Quad Left
QC - Quad Center
QR - Quad Right
EN LDR - En Leader

Figure 1-13 Basic Keyboard Layout (Type 500)

Table 1-9 Basic Keyboard Layout — Type 500 (Figure 1-13 Top Row)

KEY	LOWER CASE	UPPER CASE	*SUPER SHIFT LC	*SUPER SHIFT UC
$	Dollar Sign	Superior Dollar	------	------
1	Number One	Superior One	Inferior One	Star
2	Number Two	Superior Two	Inferior Two	Check
3	Number Three	Superior Three	Inferior Three	En Dash
4	Number Four	Superior Four	Inferior Four	Sup. Registration
5	Number Five	Superior Five	Inferior Five	En Bullet
6	Number Six	Superior Six	Inferior Six	Ballot Box
7	Number Seven	Superior Seven	Inferior Seven	Percent Sign
8	Number Eight	Superior Eight	Inferior Eight	Fraction Bar
9	Number Nine	Superior Nine	Inferior Nine	-----
Ø	Number Zero	Superior Zero	Inferior Zero	-----
;	Semicolon	Colon	-----	-----
?	Question Mark	Ampersand	-----	-----
)	Close Parentheses	Open Parentheses	-----	-----

*Located on the Auxiliary Keyboard

Table 1-10 Basic Keyboard Layout — Type 500 (Figure 1-13)

KEY	UNSHIFT	SHIFT or SHIFT LOCK
A . . . Z	Lower Case Alphabet	Upper Case Alphabet
-	Hyphen	Em Dash
!	Exclamation Point	En Leader
½	Fraction One-Half	Slash Bar
]	Close Bracket	Open Bracket
⅓	Fraction One-Third	Fraction Two-Thirds
*	Asterisk	Cents
'	Comma	Comma
,	Comma	Comma
.	Period	Period
BLR	Baseline Rule (single character)	Superior Cents
¼	Fraction One-Quarter	Fraction Three-Quarters

1.5 FUNCTIONAL CONCEPT

Refer to Figure 1-14. The System Power Supply provides DC voltages for the assemblies in the system. Pressing the PRIME button initializes the Logic and clears the displays. The Control Panel provides settings for leading, letterspace, etc. The Keyboard produces codes that are stored or processed by the Logic. The Character Display indicates characters as they are keyed, and the Line Measure Display counts down as widths are calculated. If tabular columns are set, the Tab Display indicates the active tab.

The lines are sent to the Photo Unit Logic, which processes characters and width values. The rotating Film Strips contain characters and clock slits. The Exciter Lamp and Photocell generate clock pulses for the Photo Unit Logic. When the desired character is located, a Flash signal is sent to the High Voltage Power Supply. The Flash Lamp ionizes, projecting an image of the character through the lens system onto the photographic paper.

The Motor Drive Board provides Motor Steps, which drive the traversing mirror into position for flashing the next character.

At the end of each line (or whenever leading is desired) the Leading Motor advances the paper into the cassette, clearing the paper for the next line. At the end of a take, pressing the Continuous Leading button advances several inches of paper into the Cassette, which is then removed from the system and developed in a chemical processor.

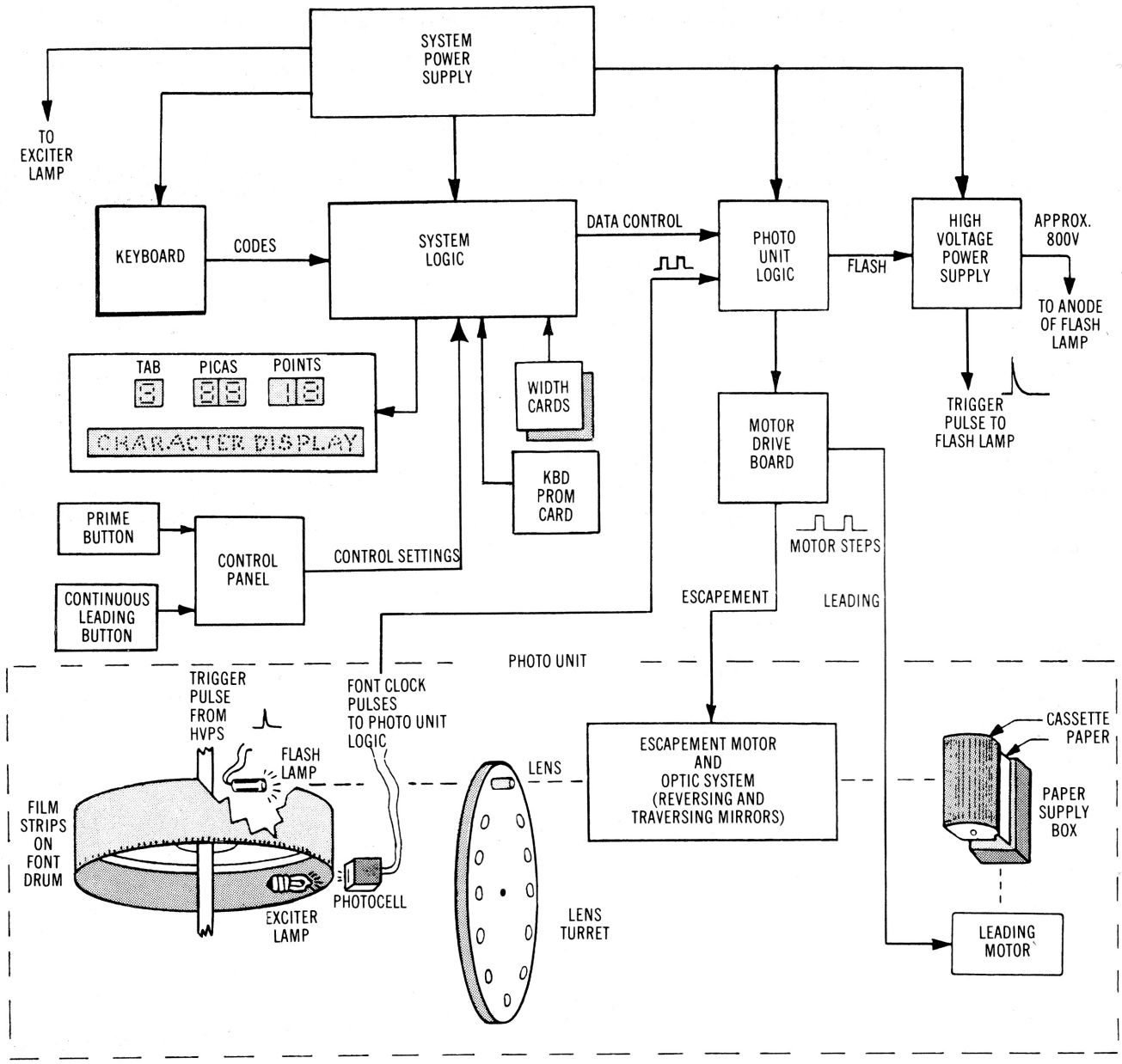


Figure 1-14 Functional Concept of System

1.6 OPERATING PROCEDURES

Consult the Applications Manual for operating and keyboarding procedures and markup instructions. Contact Technical Publications in Wilmington MA, telephone 1-617-944-6555 x389. Overseas, contact your dealer.

1.7 OPTIONS AND MOD KITS

For information on options or modification kits for various keytop arrangements, contact Sales Order Administration, 80 Industrial Way, Wilmington MA 01887; telephone 1-617-944-6555 x327. Overseas, contact your dealer.

1.8 OPERATING SUPPLIES

For operating supplies such as photomechanical paper (film) and development chemicals, contact your District Office. In the New England area, contact Grant Graphics; telephone: 1-617-658-5600, x196, 197, 198. Overseas, contact your dealer.

1.9 ACCESSORY ITEMS

For such items as filmstrips, width cards, pulleys and belts, contact Type Order Entry, Concord Street, Wilmington MA 01887; telephone 1-617-944-6555 x651. Overseas, contact your dealer.

1.10 SPARE PARTS KIT

A Spare Parts Kit that contains most of the Circuit Boards, a Flash Lamp and a font clock Photocell may be obtained by contacting the District Office. In the New England area, contact Sales Order Ad-

ministration, 1-617-944-6555 x327. Overseas, contact your dealer.

- Spare Parts Kit—Part no. 36903-501. See Table 5-3 for a listing of boards contained in kit.

1.11 PARTS ORDERING INFORMATION (Catalog in Supplement)

Consult the Parts Catalog in the Supplement section of this manual for parts order instructions.

1.12 LIST OF RECOMMENDED TOOLS

- Insulated TV alignment tool (plastic "trimpot" tool included in Maintenance Kit).
- Assorted screwdrivers, flat and phillips blade
- Assorted wrenches and nut drivers

1.13 INSTALLATION

According to warranty requirements, the location of the equipment must have good air circulation and be free from excessive dirt, dust, moisture, and fumes. Temperature should not exceed 80 F. for optimum operation. Operation at temperatures above 85 F. can be detrimental to internal components, decreasing their life expectancy. Temperature should be measured at the input to the fans on the unit being installed.

New systems are installed by Service Representatives, using the Installation Checklist at the rear of this manual.

SECTION II
PREVENTIVE MAINTENANCE

2.1 GENERAL

This Preventive Maintenance Schedule should be followed to insure trouble-free operation and clean output copy. A Preventive Maintenance sticker is included in the Supplement Section of this manual. A sample schedule is shown in Figure 2-1. For detailed procedures, see Paragraph 2.3.

COMPUWRITER IV/UNIVERSAL IV

PREVENTIVE MAINTENANCE SCHEDULE

SERIAL NUMBERS 2000 AND ABOVE

–INSTRUCTIONS–

WARNING: REMOVE PLUG FROM WALL OUTLET WHEN PERFORMING PREVENTIVE MAINTENANCE

–WEEKLY–

FILTER–Remove and vacuum both dust filters. Replace large filter every six months or more often as needed.

JAN ☐☐☐☐☐ FEB ☐☐☐☐☐ MAR ☐☐☐☐☐ APR ☐☐☐☐☐ MAY ☐☐☐☐☐ JUN ☐☐☐☐☐

JUL ☐☐☐☐☐ AUG ☐☐☐☐☐ SEPT ☐☐☐☐☐ OCT ☐☐☐☐☐ NOV ☐☐☐☐☐ DEC ☐☐☐☐☐

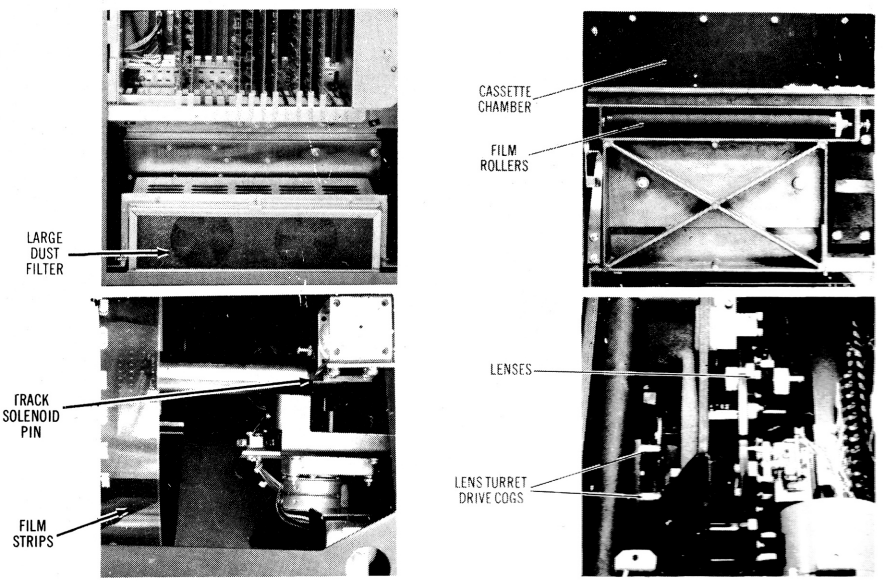
CASSETTE AND FILM ROLLERS–Remove bits of paper and dust from cassette and film rollers.

–TWO MONTHS–

TRACK SOLENOID PIN AND SUPPORT BEARINGS–Lubricate solenoid pin, track selector rack and arm with CG53341 grease. Lubricate support bearing with CG53340 oil.
LENS TURRET DRIVE COGS–Lubricate drive cogs with CG53341 grease.

–AS REQUIRED–

FILM STRIPS–Clean Film Strips with Font and Film Cleaner CG56996 and a soft, lint-free cloth.
LENS–Clean lenses with tissue moistened with alcohol (90% or better).
OPTICAL MIRROR–Clean mirror surfaces per Section II of Customer Maintenance Manual.
EQUIPMENT EXTERIOR–Wipe exterior of equipment with solution of water and mild detergent.
KEYBOARDS–Vacuum clean keytop areas with soft brush attachment.



325-325 10/76 REV 1

Figure 2-1 Preventive Maintenance Schedule

2.2 SAFETY PROCEDURES

For greatest safety during Preventive Maintenance, adjustments and replacement of parts, follow these safety guidelines:

1— Turn power OFF and remove plug from wall outlet as directed when servicing the interior of the unit.

2— If safety covers must be removed in order to service the unit, be certain to replace them. Refer to Figure 2-2.

NOTE

Many of the photos of the font chamber in this manual show the safety cover removed in order to identify parts.

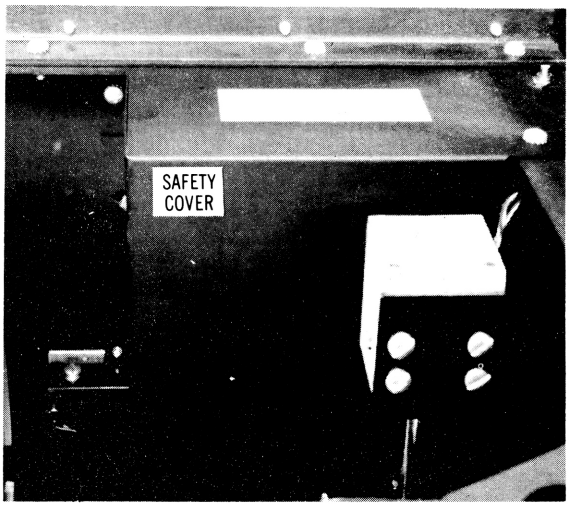


Figure 2-2 Photo Unit Safety Cover

2.3 PREVENTIVE MAINTENANCE PROCEDURES

2.3.1 Filter Cleaning (Weekly)

The two Dust Filters should be cleaned weekly or more often if required. Replace the large dust filter every six months as it loses efficiency after extended use and can cause overheating of the system.

1— (POWER OFF) Remove the rear panel (four fasteners) and one filter bracket screw (See Figure 2-3).

2— Remove font chamber side panel (four fasteners) and remove Dust Filter behind Blower.

NOTE

Font chamber blower screws may have to be loosened to remove Dust Filter.

3— Vacuum clean or wash both filters with a detergent solution. Dry before installing.

WARNING

Do not blow dust from the filter with air pressure, as damage to the eyes may result.

2.3.2 Cassette and Film Rollers (Weekly)

Bits of paper in the cassette or on the film drive rollers can get on to the film and obscure the flash, causing bad copy.

1— Lift the hinged cover to the cassette chamber and remove the film cassette (Figure 2-4).

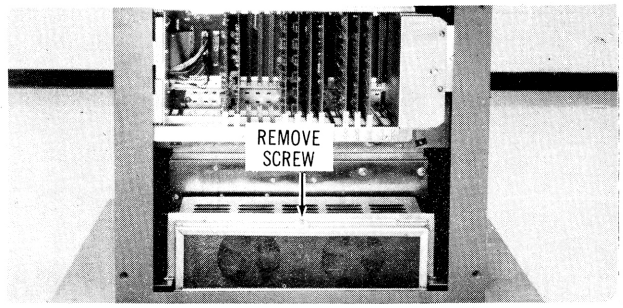


Figure 2-3 Large Dust Filter

2— Loosen the knurled end-screw and open the cassette. Remove any foreign materials and reassemble.

3— Remove the magnetic cover to the film chamber. Lift the two end latches and remove film pressure plate.

4— Brush dust and bits of paper from the rollers and reassemble. Replace covers.

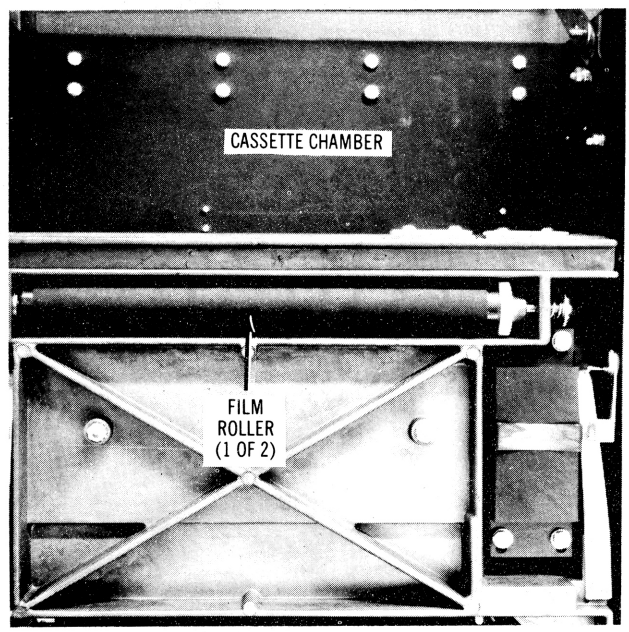


Figure 2-4 Film Cassette and Rollers

2.3.3 Track Assembly (Two Months)

The moving parts of the font track selector assembly should be lubricated every two months to insure smooth operation and low wear.

1— (POWER OFF) Lift the Photo Unit cover to expose the track assembly (Figure 2-5).

2— Lubricate the solenoid pin, the track selector rack (below) and the selector arm with CG53341 dark grease (included in Maintenance Kit 36902-501).
3— Lubricate the track support bearings (Figure 2-5) with CG53340 light oil (included in Maintenance Kit 36902-501).

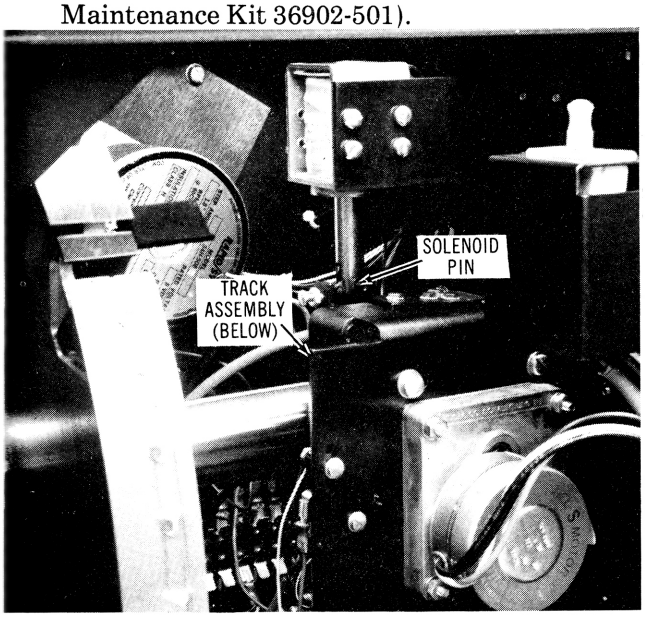


Figure 2-5 Track Selector Assembly

2.3.4 Lens Selector Cogs (Two Months)

The lens selector (geneva) drive cogs should be lubricated every two months to provide smooth operation and low wear (Figure 2-6).

CAUTION

Set lens selector to 12 points prior to removing power. This will maximize lubricating space and avoid grease on lens.

(POWER OFF) Remove the top Photo Unit cover (four screws) and lubricate the cogs with CG53341 dark grease.

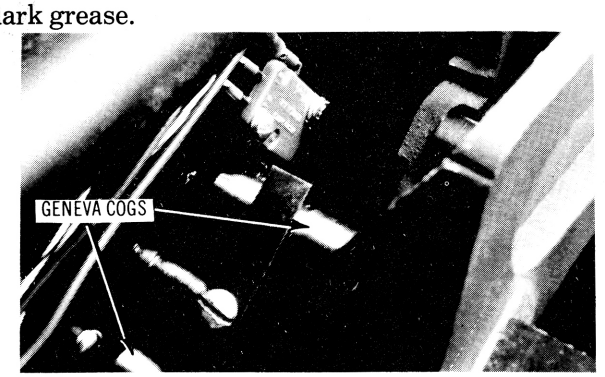


Figure 2-6 Lens Selector Cogs

2.3.5 Lenses (As Required)

Lenses may require cleaning after extended use, especially in a dusty or smoky environment.

1— (POWER OFF) Remove top Photo Unit cover. Refer to Figure 2-7.
2— Clean the lenses within reach with a lens tissue moistened with isopropyl alcohol (90% or greater).
3— Restore power to rotate turret for access to remainder of lenses. Turn power OFF before continuing.
4— Clean the remainder of the lenses as in Step 2.

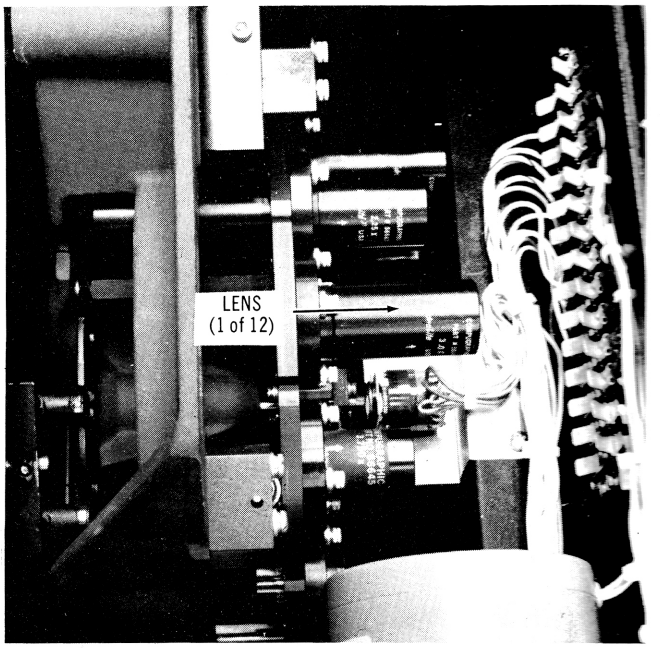


Figure 2-7 Lens Chamber

2.3.6 Condensing Lens (As Required)

The flash condensing lens is located in the font chamber beside the font drum.

1— (POWER OFF) Lift the Photo Unit cover and remove the Film Strips from the drum. Refer to Figure 2-8.
2— Clean the condensing lens per 2.3.5.

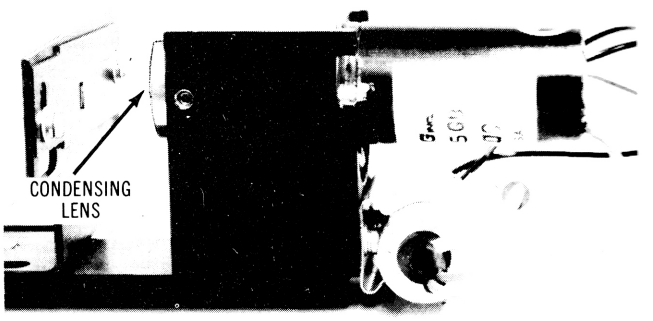


Figure 2-8 Flash Condensing Lens

2.3.7 Photocell Mask (As Required)

The Photocell has a plastic mask that may require periodic cleaning.

1— (POWER OFF) Lift the Photo Unit cover and remove the Film Strips. The Photocell mask is beside the font drum.

2— Clean the plastic mask (Figure 2-9) with a cotton swab moistened with isopropyl alcohol (90% or greater).

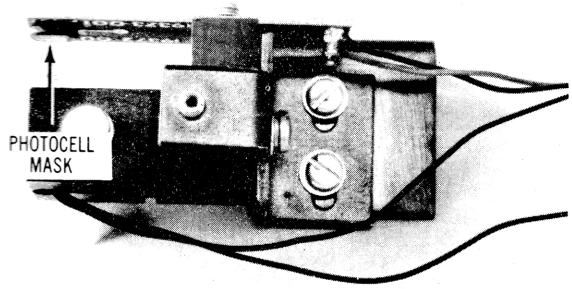


Figure 2-9 Font Photocell Mask.

2.3.8 Film Strips (As Required)

Film Strips may become dusty or grimy, causing bad output copy or improper flash timing. Clean as follows:

1— (POWER OFF) Lift Photo Unit cover and remove the Film Strips from the drum.

2— Clean the Film Strips on both sides with a soft cloth moistened with CG56996 Font and Film Cleaner.

SCRATCHES—Scratches may be touched up using india ink or a graphic pen. Apply the ink to the emulsion side of the Film Strip.

STORAGE—Film Strips should be stored in their protective plastic envelopes and hung on a hook.

2.3.9 Painted Surfaces (As Required)

The painted exterior of the unit may be cleaned as follows:

1— Remove power cord from wall plug. DO NOT clean unit with plug in wall.

2— Wipe painted exterior of unit with a soft, lint-free cloth moistened with a mild detergent solution.

2.3.10 Keytop Area (As Required)

The keytop area may be vacuumed using a soft brush attachment. Do not use air under pressure, as this will drive dust particles into keyboard elements. Turn power OFF before cleaning.

WARNING

Do not use air under pressure to blow dust, as this can result in injury to the eyes or damage to the keyboard.

2.3.11 Control Panel (As Required)

The plastic windows on the displays may be cleaned using a soft cloth moistened with a detergent solution.

CAUTION

Do not clean the control panel using solvents such as trichlorothene or acetone, as etching of the plastic windows will occur.

2.3.12 Mirror Surfaces (As Required)

The optical mirror surfaces may need cleaning after extended use of the sytem. Note that a small amount of dust has no effect on the output copy. Cleaning should be attempted only if required. Small scratches during cleaning will not affect output copy, as the mirrors are not in the focal plane.

CAUTION

Do not contact mirrors with metal objects. Do not get fingerprints on mirrors. Do not use tissue paper, as it tends to scratch mirrors.

1— Remove power plug from wall outlet.

2— Open film chamber, remove film pressure plate (two fasteners, Figure 2-10). The traversing mirror should now be visible, and can be cleaned by blowing the dust away with an air brush, or with a soft, camel's hair brush.

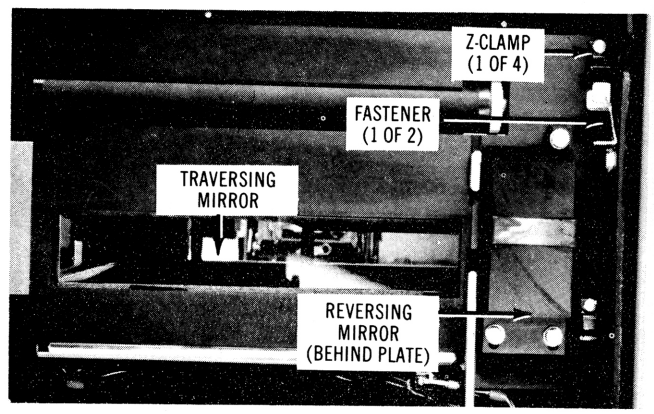


Figure 2-10 Photo Unit Mirrors

3— Loosen the screws holding (four) Z-clamps and remove the film backing plate by lifting up ½", out ½" then down (Figure 2-11). The reversing mirror is behind the plate.

4— Clean as in Step 2.

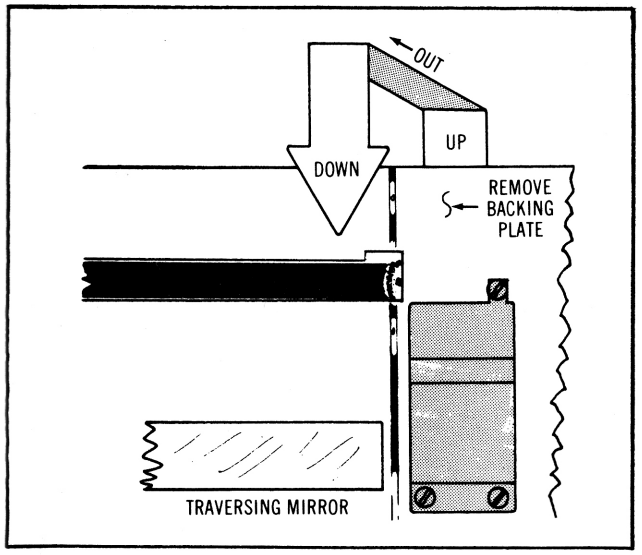


Figure 2-11 Removal of Backing Plate for Access to Reversing Mirror

NOTE

Fingerprint smudges may be removed by breathing on the mirror and wiping off the smudge with cotton swab.

5— Replace the film backing plate in reverse order (up, in, down) and ensure that the plate bottoms properly as the Z-clamps engage the four pins.

NOTE

The plate must bottom out or the optics will not return to the original alignment.

6— Tighten the Z-clamp screws, but not so tight as to distort the metal clamps.

7— Replace the film pressure plate, locking the two fasteners.

SECTION III
TROUBLESHOOTING

3.1 GENERAL

If the system is not working properly, please check the following items before contacting the District Office for service. These checks take very little time and will save time in the long run.

- If the system is completely dead, see if the line cord has been accidentally pulled from the power outlet, or if the circuit breaker has tripped.
- Check fuse lamps.
- Check to see if the NO FILM lamp is blinking. Replenish film (paper) supply if necessary.
- Check the front panel switches and the special control switches under the top cover for correct positions.
- See that the Film Strips are properly installed on the font drum.
- Check to see that the Width Cards and the Keyboard PROM Card are inserted properly, and are correct for the Film Strips and keyboard layout being used.
- If there is a question about the proper keying sequence, consult the Applications Manual.

If difficulty is encountered, contact the Technical Consultant. To save time, be prepared to provide the following information: Model and serial number (for example, CompuWriter IV, serial number 2116), existing symptoms and what has been attempted to solve the problem, if appropriate.

A list of addresses and phone numbers is included in Section I of this manual for the purpose of contacting the appropriate District Service Office.

3.2 COMMON PROBLEM SOURCES

3.2.1. The Most Common Problem

An improperly wired or inadequate AC service can cause many system problems. The line voltage and frequency must conform to the rating stamped on the chassis next to the line fuse (See Paragraph 5.2.4). As directed by the Guide to a Successful Installation, the system must be plugged into a separate, grounded power outlet that delivers 15 amperes or more.

Other equipment such as Teletype, Tape Punches, etc., plugged into the same outlet can cause the System Logic to behave erratically, and this is specified as an improper installation. Also, if the line voltage varies (goes too high or too low) this could be the source of many problems.

3.2.2 Other Common Problem Sources

3.2.2.1 WRONG SWITCH POSITIONS

Another common source of improper machine function is a switch in the wrong position. It takes about one minute to check the system for improper switch positions.

Refer to Section I for a brief description of the function of each switch. For a complete description of the use of switches and keys, consult the Applications Manual.

3.2.2.2. CONNECTORS LOOSE OR DISENGAGED

A loose connector can cause an intermittent system problem. A disengaged Power Supply connector can completely disable the unit.

WARNING

Power should be turned OFF before handling any cables or other connectors.

Check for proper seating of Width Cards, Keyboard PROM Card etc. Ensure that all "quick-disconnects" are plugged into the terminal boards. Check Power Supply Regulator Board to see that all power connectors are mating. Check flat ribbon connectors behind the Control Panel.

3.2.2.3. LACK OF LUBRICATION

The mechanical parts of the system may cease to work properly if not lubricated. Refer to Section II.

3.2.2.4 DIRTY FILM STRIPS OR OPTICS

If output copy is garbled, too light or broken up, the most likely cause is a dirty Film Strip, lenses or Photocell. Refer to Section II.

3.2.3 Troubleshooting Guides

Table 3-1 includes the more common symptoms, probable causes and recommended action to be taken. Table 3-2 is used to improve the efficiency in problem solving by changing the boards. All boards in Table 3-2 are contained in the Spare Parts Kit 36903-501.

Table 3-1 Troubleshooting Guide—General

SYMPTOM	PROBABLE CAUSES	RECOMMENDED ACTION
POWER switch ON, but no lights, no action.	AC line service out, or unit accidently unplugged. Line fuse blown.	Take steps to insure that AC power is available to unit. Check fuse per Section V.
One or more functions missing from unit.	Power Supply fuse blown Cable disconnected.	Check fuse lamps per Paragraph 5.2 Check connectors.
System does not respond to keyboard.	PROM CARD missing.	Insert PROM CARD.
System does not respond to Keyboard, and a tone is heard.	Out of film (keyboard is locked out).	Replenish Film.
System overheating.	Clogged filter. Room temperature too high or direct sunlight.	Clean filter per 2.3.1. Ventilate room or relocate system.
Font drum noisy.	Belt too tight; must be slack for quiet operation.	Adjust font drum belt tension per 4.2.5.
NO FILM lamp stays on, even with adequate film and a tone is heard.	Microswitch roller not adequate pressure on film.	Adjust microswitch position per 4.2.4.
NO FILM lamp stays out with film removed, and a tone is heard.	NO FILM lamp defective.	Replace NO FILM lamp per 5.3.
Vertical mark or impression on left side of output copy.	NO FILM microswitch roller excessive pressure on film.	Adjust microswitch position per 4.2.4.
Copy density too dark.	High Voltage Power Supply too high.	Adjust High Voltage per 4.2.1.
Copy density too light.	Weak or cold chemicals. Defective or desensitized paper. Dirty Film Strip. Dirty condensing lens or projecting lenses. High Voltage Supply too low. Flash lamp inefficient.	Change chemicals, or allow to warm up. Replace paper. Clean Film Strip per 2.3.8 Clean lens per 2.3.5, 2.3.6. Adjust High Voltage per 4.2.1. Replace flash lamp per 5.5.
Garbled copy. Characters flash between baselines.	Dirty or scratched Film Stirp. Dirty Photocell mask.	Clean Film Strip per 2.3.8. Clean mask per 2.3.7.
Garbled copy in upper magazine (Tracks 5-8) operation only.	Dirty or scratched upper magazine Film Strip. Font drum masking plate needs adjustment.	Clean Film Strip per 2.3.8. Position masking plate per 4.2.3.
Erratic escapement.	Loose Width Cards. Escapement idler spring fallen off.	Check seating of cards. Check idler spring per Figure 4.8.
Leading erratic.	Leading belt improper tension.	Check belt tension per 4.2.6.
System makes lens changes and escapes spaces but halts on flashable codes.	Exciter Lamp burned out. No Film Strips on drum.	Check Exciter Lamp. Install Film Strips.

Table 3-1 Troubleshooting Guide—Printed Circuit Boards*

SLOT/DESCRIPTION		CG NUMBER	PROBABLE SYMPTOMS IF CARD FAILS
1	Photo Unit A	36172-501	No Flash. Leading problems. Wrong lens or track selection, or total failure.
2	Photo Unit B	35796-501	Escapement erratic.
3	—EMPTY—	—	—
4	—EMPTY—	—	—
5	—EMPTY—	—	—
6	Program Card	36802-502	Any malfunction that is characterized by exact repetition with each trial.
7	Program Card	36802-503	Any malfunction that is characterized by exact repetition with each trial.
8	Data RAM	34044-502	Characters display correctly as keyed, but change erratically with additional keying.
9	Processor Interface	35794-501	Erratic signal tones. Switches and indicators on Control Panel inoperative.
10	—EMPTY—	—	—
11	CPU A	34325-501	Displays incorrect. Erratic output copy.
12	CPU B	34319-501	Improper width calculations. Meaningless line measures on display.
13	CPU C	34305-501	Symptoms similar to Program Cards. Generally change this card first.
14	—EMPTY—	—	Used for Test Panel.
15	—EMPTY—	—	—
Keyboard Interface		36039-501	Wrong lens or track position. Wrong characters on display. Failure to execute selected switch values. Meaningless line measures.
High Voltage Flash		32590-501	Erratic flashing; no flash at all; cannot adjust density properly.
Motor Control		36032-501	Track select inoperative (check fuse). Track motor vibrates. Lens turret motor problems.
Motor Driver		35683-501	Track select solenoid doesn't work. Exciter Lamp intensity problems. Leading or escapement motors do not work properly.

*All boards in Table 3-1 are contained in Spare Parts Kit 36903-501. Replacement procedure for all boards is contained in Section V. Keep the Spare Parts Kit stocked by re-ordering as required.

3.3 DIAGNOSTIC KEYBOARDING PROCEDURES

3.3.1 General

The procedure in this section checks all of the basic system functions by producing output copy to be compared to a standard (Figure 3-1). This should serve as a valuable tool in diagnosing system problems.

Paragraph 3.3 is intended for diagnosing symptoms that are not obvious, such as justification, quadding or tabbing problems. If the system has obvious problems such as garbled copy, intermittent flash or poor copy density, consult Table 3-1 Troubleshooting Guide.

3.3.2 Diagnosing the Output Copy

After the sequences in Paragraph 3.3.3 are carefully keyed, the resulting output copy is compared with Figure 3-1. Failure of the system to perform any function tested should be obvious. Note and record the function tested, along with any discrepancies. Contact the Technical Consultant for assistance with the diagnosis.

If desired, the keying sequence for the apparent failure(s) may be repeated to make certain that the system consistently fails in that function (or to validate the first keying effort).

3.3.3 Keyboarding Sequences

3.3.3.1 GENERAL

After the initial setup as outlined below, the keyboarding sequence is followed through each test, with changes to the settings as directed. It is very important that the keying be accurate, as any keying mistake would reflect on the output copy and the system would appear to have a problem in that area.

3.3.3.2 INITIAL SETUP

- Line Measure Set—42 picas, 00 points
- Point Size—12 points
- Typeface—Track 1
- Leading switches—16 points
- Letterspace switch—OFF
- Character Comp. switch—OFF
- SB MIN switches—(12)

Table 3-2 Diagnostic Keyboarding Procedure

TEST NAME or (INSTRUCTIONS)	KEYING SEQUENCE
1. SB Expansion Test	**m** (spaceband) **m** (RET)
2. SB Expansion; No LS Test	**mmmm**... 23m's total... **mm** (spaceband) **mmmm**... 23m's... **mm** (RET)
3. Letterspace Test, One SB Line (Letterspace Switch ON)	**mmmm**... 23m's total... **mm** (spaceband) **mmmm**... 23 m's... **mm** (RET)
4. SB Minimum Test (SB MIN Switches 4) (SB MIN Switches 8) (SB MIN Switches 16) (SB MIN Switches 32)	**Minimum Spaceband of 4 units** (QL) (RET) **Minimum Spaceband of 8 units** (QL) (RET) **Minimum Spaceband of 16 units** (QL) (RET) **Minimum Spaceband of 32 units** (QL) (RET)
5. Character Compensation Test (SB MIN Switches 12) (Char. Comp. 0; Switch ON) (Character Compensation 1) (Character Compensation 2) (Character Compensation 4) (Character Compensation 7)	 **Compugraphic** (QL) (RET) **Compugraphic** (QL) (RET) **Compugraphic** (QL) (RET) **Compugraphic** (QL) (RET) **Compugraphic** (QL) (RET)
6. Leading, Tab, Insert Rule Test (Point Size 6, Leading 0, Char Comp OFF) (Leading ½) (Leading 1) (Leading 2) (Leading 4) (Leading 8) (Leading 16) (Leading 32) (Leading 64) (Leading 16)	 (TAB) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (MJ) (INS RULE) (PLUS LINE SP) (CARR RESET) (INS RULE) (RET)
7. Plus and Minus Line Space Test (Point Size 12)	 **Plus** (PLUS LINE SP) **line** (PLUS LINE SP) **space and Minus** (MINUS LINE SP) **line** (MINUS LINE SP) **space** (QL) (RET) (RET) (RET) **Plus** (#1 PT LEAD) **one** (#1 PT LEAD) **point** (# PT LEAD) **and** (–1 PT LEAD) **minus**
8. Plus and Minus 1 PT Leading Test	(–1 PT LEAD) **one** (–1 PT LEAD) **point** (QL) (RET) (RET)
9. Forward, Back One Point Test (After each character set, key FWD ONE PT) (Normal keyboard operation) (After each character set, key BACK ONE PT)	 **Fwd and back one point** (QL) (RET) **Fwd and back one point** (QL) (RET) **Fwd and back one point** (QL) (RET)
10. Forward, Back One Unit Test (After each character set, key FWD ONE UNIT) (Normal keyboard operation) (After each character set, key BACK ONE UNIT)	 **Fwd and back one unit** (QL) (RET) **Fwd and back one unit** (QL) (RET) **Fwd and back one unit** (QL) (RET)
11. Non Photo Test	**NON PHOTO** (QL) (RET) **N** (NON PHOTO) **ON PHOT** (PHOTO) **O** (QL) (RET)
12. Flash Only Test (ZS, SZ)	(FLASH ONLY) **ZS** (FLASH ONLY) **SZ** (Repeat this sequence eight more times (QL) (RET)

- SB MAX switches—(48)
- TAB SET—All tabs at 4 picas
- FONT—Futura 119272-0103
- WIDTH CARD—119272-0203A

NOTE

Turn to Page 3-5 for the Keyboard Tests and sample Output Copy (Figure 3-1).

3.3.3.3 KEYBOARDING TESTS

Refer to Table 3-2 for the various tests, appropriate setting changes and keying sequence for each test. Note that the Tests and the Output Copy are numbered 1-13 for easy reference (See Figure 3-1).

In the keying sequence column, set only the letters that are bold. The commands in parentheses are one-key functions and are not to be set as individual letters.

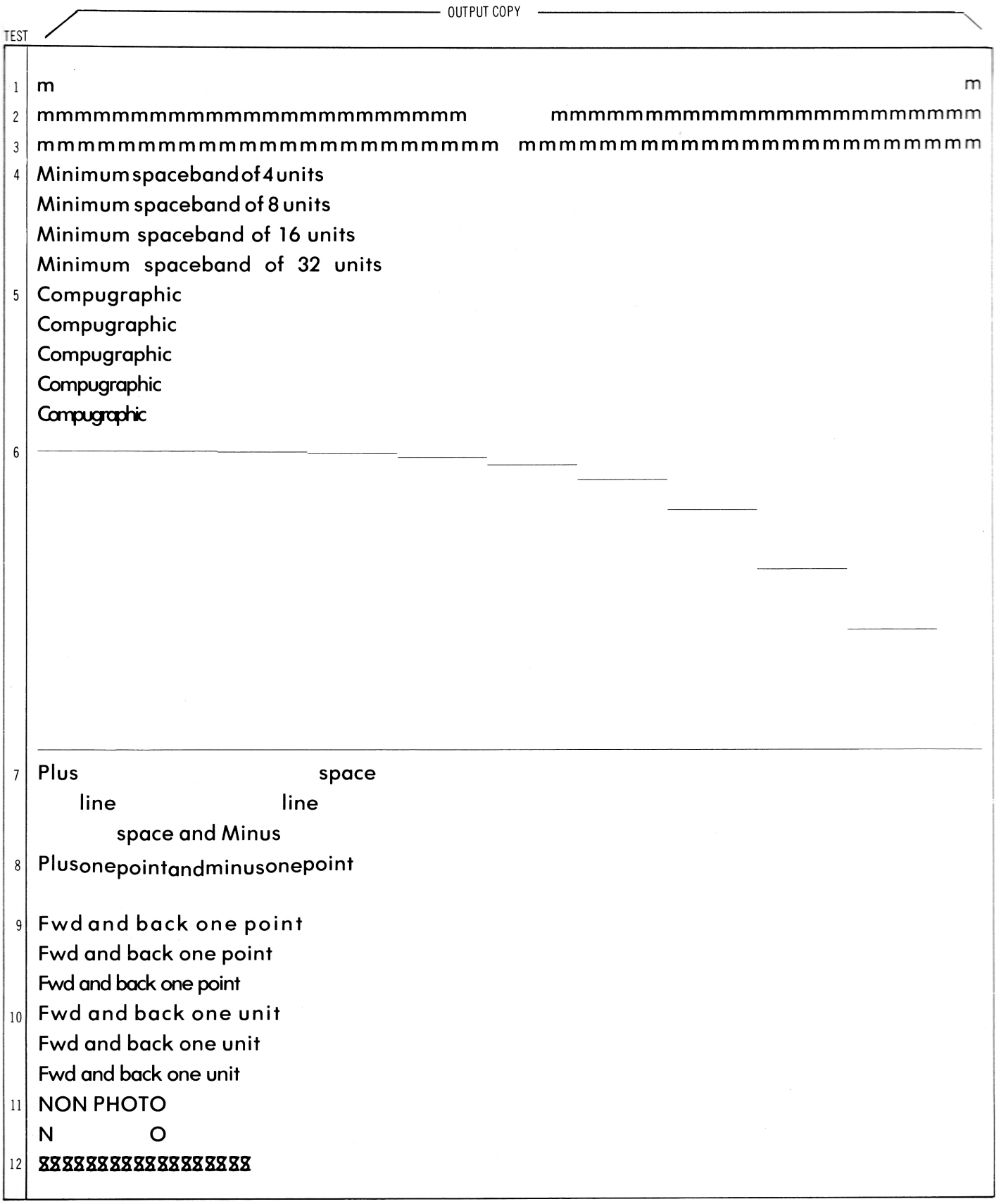


Figure 3-1 Diagnostic Keyboarding Output Copy (42 picas)

SECTION IV
ADJUSTMENTS

4.1 GENERAL

The adjustment procedures in this section are for the convenience of the customer. Technical Consultants may be contacted by telephone, to assist in making adjustments. For assistance, contact the District Office and state the name of the system. Be prepared to briefly describe the nature of the problem that requires the adjustment. Overseas, contact the Company Representative.

4.2 ADJUSTMENTS

4.2.1 Output Copy Density (High Voltage)

The High Voltage Power Supply may be adjusted to obtain the desired output copy density. Before adjusting, make sure that the improper density is not caused by weak chemicals, old film, dirty Film Strip or lenses. Note that an aging Flash Lamp can also cause poor density.

WARNING

Remove the power plug from the wall outlet before proceeding.

1— Loosen two screw fasteners at the top corners of the Control Panel and lower the hinged panel (See Figure 4-1).

2— Using an insulated TV alignment screwdriver, turn the screw through the hole (½ turn at one trial):
- Counter-clockwise for blacker copy
- Clockwise for lighter copy.

3— Close the Control Panel and restore power.

4— Run some copy to test density. Repeat, if necessary, to obtain desired density. If no improvement, Contact Technical Consultant.

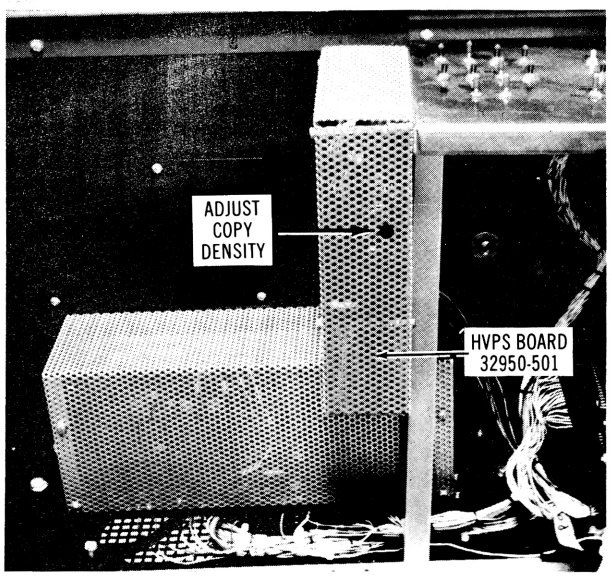


Figure 4-1 Copy Density Adjustment

4.2.2 Exciter Lamp Alignment

The Exciter Lamp light beam should be oriented in a horizontal pattern and focused on the Photocell. This alignment is very important to the correct function of the system. After replacing a faulty Exciter Lamp, or if the position of the Exciter Lamp is out of alignment, follow this procedure.

CAUTION

Do not loosen or move the Exciter Lamp assembly during this alignment. Do not apply excessive vertical pressure on the assembly. Place hand under assembly when tightening or loosening screw.

1— (POWER OFF) Lift Photo Unit cover and remove Film Strips from drum.

2— Using the least possible vertical force, loosen the binding screw (Figures 4-2, 4-3).

3— Hold the Exciter Lamp wires, rotate the lamp inside the block so that the light pattern that is cast on the Photocell is horizontal (Figure 4-4), and move the lamp in and out to focus the pattern.

Figure 4-2 Exciter Lamp Assembly in Photo Unit

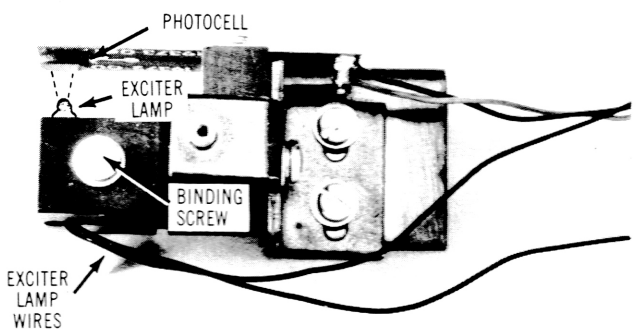


Figure 4-3 Exciter Lamp (58978-001) and Photocell Board (19373-502)

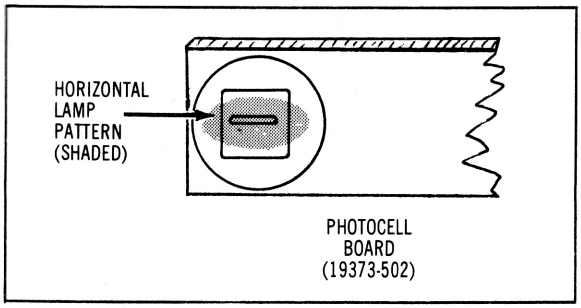


Figure 4-4 Horizontal Light Pattern

NOTE

The Film Strip must be able to pass between the Exciter Lamp and Photocell. Do not place the lamp more than 1/16" (1.6mm) outside the housing.

4— Carefully tighten the binding screw. Check clearance in all four tracks before restoring power.

4.2.3 Font Drum Masking Plate (19399-001)

The masking plate on the font drum should cover the gap between the lower magazine and upper magazine Film Strips. This plate, when properly positioned, should not hit the Exciter Lamp and Photocell assembly. While positioning this plate, be certain to test the clearance after each adjustment, as damage to the Exciter Assembly would disable the unit. After this alignment is completed, make certain that the plate does not interfere with the proper spring tension of the film clip.

1— Lift the Photo Unit cover and remove the Film Strips (Figure 4-5).
2— Loosen the two mounting screws only enough to move the plate.
3— Position the plate to cover the gap between the Film Strips (check clearance).

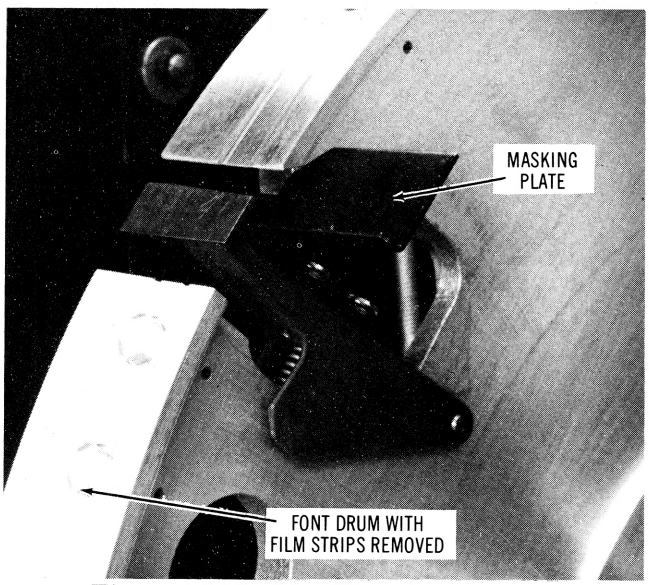


Figure 4-5 Masking Plate (19399-001)

NOTE

It may be necessary to bend the plate somewhat to clear the Exciter assembly.

4— Replace Film Strips and check clearance with the system in all four tracks. If all conditions are met, tighten the binding screws.
5— Check clearance, then lower the Photo Unit cover and test system function in upper magazine (Tracks 5-8).

4.2.4 No Film Switch (52667-001)

The No Film microswitch is held in by the presence of photographic paper and is released (actuated) when the film supply is exhausted. When this occurs, the NO FILM lamp blinks and the system is not allowed to operate.

The roller at the end of the switch actuator arm should be positioned for reliable operation, but should not press on the film with so much pressure as to leave a mark.

1— Remove the magnetic cover to the film supply area.
2— Remove the film pressure plate by lowering the two top fasteners (Figure 4-6) and tilting the plate downward, then lifting upward. Remove the film.
3— Loosen the switch mounting screws only enough to move the switch.
4— Position the switch to meet the desired conditions and tighten the screws.
5— Insert film between the switch roller and backing plate and tighten the fasteners.
6— Check for proper system operation, and ensure that the roller is not marking the film.

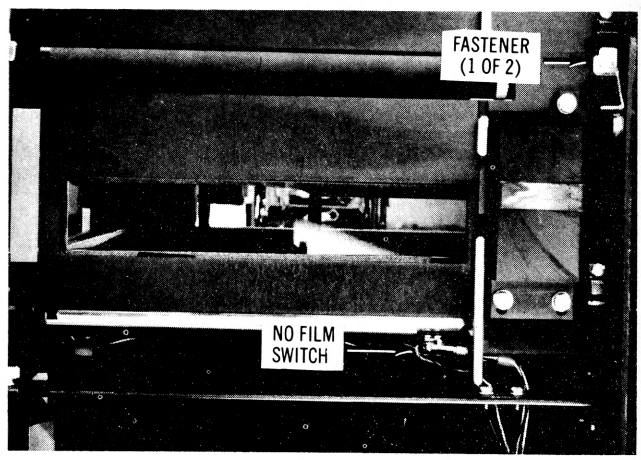


Figure 4-6 No Film Switch Adjustment

4.2.5 Font Drum Belt (56461-001) Tension

The tension of the font drum belt should be slightly less than the weight of the motor. The proper tension required for extended bearing lift and quiet operation.

1— Remove the power plug from the wall outlet.
2— Remove the rear Photo Unit panel (four screws).
3— Loosen four mounting screws (Figure 4-7) and allow the weight of the motor to tense the belt.
4— Squeeze the belt together somewhat as the mounting screws are tightened. Belt should be rather slack (½" play).

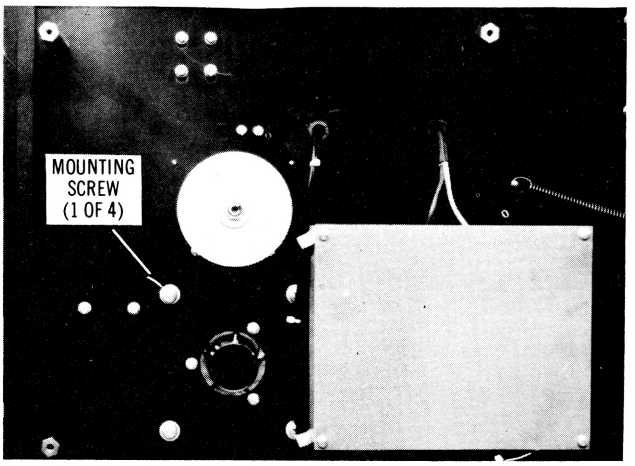
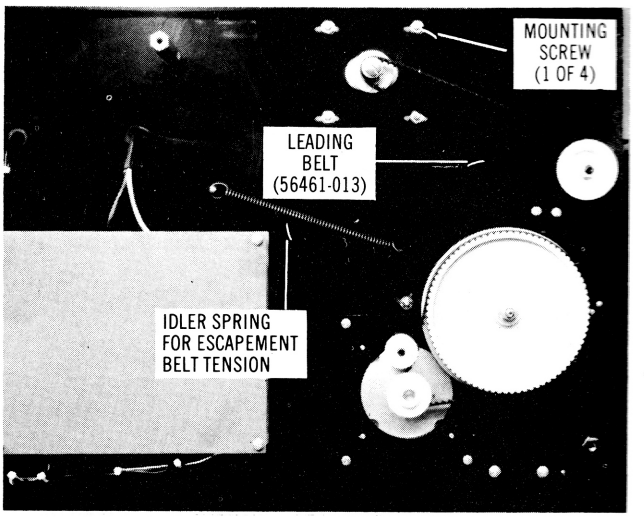


Figure 4-7 Font Drum Belt Tension

4.2.6 Leading Belt Tension

The leading belt must have the correct tension for accurate leading and extended bearing life.

1— Remove the power plug from the wall outlet.
2— Remove the rear Photo Unit panel (four screws).
3— Looen four mounting screws (Figure 4-8) and slide the motor to the left to increase tension. Tension is correct when one pound (.45 kg) of pressure at a right angle to the belt produces ¼ inch (6.35 mm) deflection of the belt.



(NOTE THAT NO ADJUSTMENT IS REQUIRED FOR THE ESCAPEMENT BELT)

Figure 4-8 Leading Belt Tension

SECTION V
REPLACEMENT PROCEDURES

5.1 GENERAL

The replacement of several assemblies and components is described in this Section. A summary appears in Table 5-1.

IMPORTANT — Refer to Safety Procedures, Paragraph 2.2 before performing any replacement.

Table 5-1 Summary of Replacements

ASSEMBLY OR COMPONENT	PARAGRAPH
Power Supply Fuses	5.2
Panel Lamps (LED's)	5.3
Exciter Lamp	5.4
Flash Lamp	5.5
Font Drum Motor	5.6
Leading Motor	5.7
Escapement Motor	5.8
Tab/Line Measure Display	5.9
Character Display	5.10
Line Counter	5.11
Main Keybaord	5.12
Logic Boards	5.13
Keyboard Interface Board	5.14
High Voltage Flash Board	5.15
Motor Control Board	5.16
Motor Driver Board	5.17

5.2 FUSES

5.2.1 General

The fuses are intended to protect the Power Supply and other electrical circuits in the system. A blown fuse is normally indicated by a fuse lamp that does not light, and a failure of one or more functions. Sometimes a problem is solved by simply replacing the fuse. Always replace with a fuse of the same rating. In the case of repeated fuse-blowing, contact the Technical Consultant.

WARNING

Remove power cord from the wall outlet before changing fuses. Whenever the cord is plugged in the wall, there is voltage present in the system.

5.2.2 Types of Fuses

Figure 5-1 shows some of the types of fuses used in this system. Note that the slow-blow fuses have a spring inside the glass case. The regular fuses have a simple link element or a spiral or wavy element. A regular fuse should not be replaced with a slow-blow fuse, even if they have the same ratings.

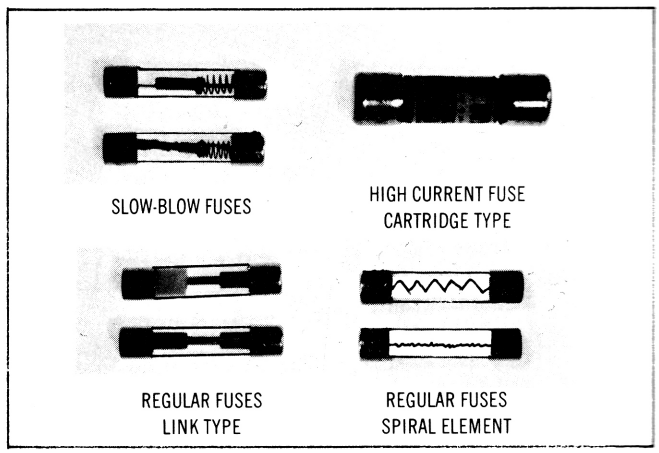


Figure 5-1 Some Types of Fuses

5.2.3 Replacing a Fuse

1—Remove plug from wall outlet.

2—Push the black cap on the fuse holder inward, then twist the cap counter-clockwise and pull the cap and fuse out. (Figure 5-2).

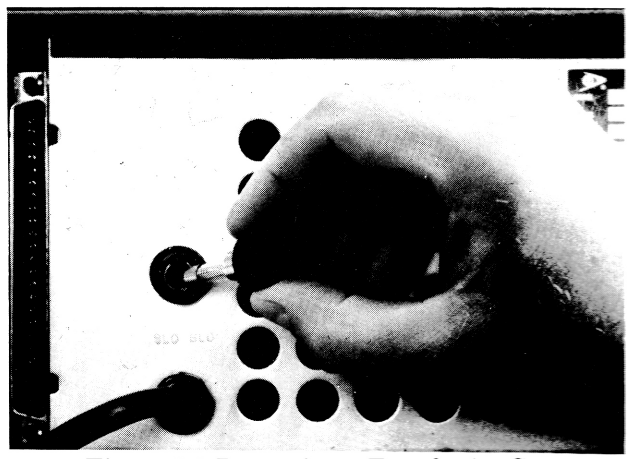


Figure 5-2 Removing a Fuse by its Cap

3—Remove the fuse from the cap by pulling it out (Figure 5-3). Replace if blown.

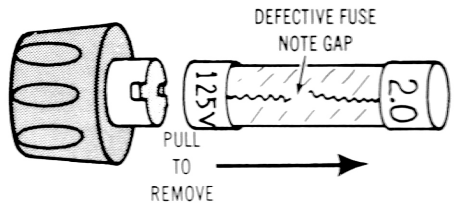


Figure 5-3 Removing a Blown Fuse

4—To install the fuse, push inward and twist the cap clockwise. Either end of the fuse may be inserted into the cap, as fuses have no polarity.

5.2.4 Line Fuse (Figure 5-4)

The line fuse is associated with the POWER ON-OFF switch and a POWER indicator lamp on the Control Panel. If the lamp lights with power ON, the fuse is OK and there is no need to check it. If the system is dead and the house circuit breaker is OK, the line fuse is likely to be blown. Make certain that power plug has not fallen out accidentally.

To replace the line fuse:

1— Remove power plug from the outlet.
2— Loosen four screws and remove front lower panel. The line fuse is shown in Figure 5-4.
3— Remove the cap by turning it several turns counter-clockwise. The fuse comes out with the cap.

The value of the line fuse is stamped or embossed on the chassis and is as follows:

- 7A for 230 Volt Operation (CG NO. 57609-026)
- 12A for 115 Volt Operation (CG No. 57609-030)

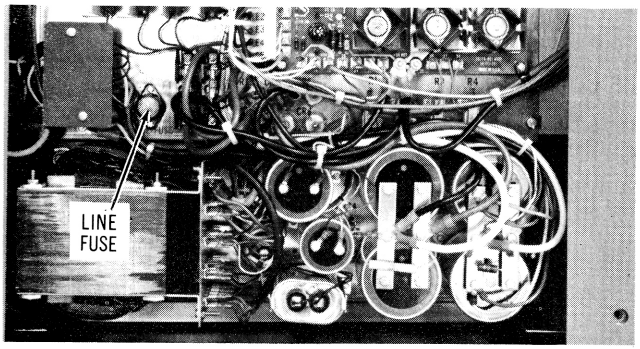


Figure 5-4 Line Fuse

5.2.5 Power Supply Fuses (Figure 5-5)

There are seven fuses (other than the line fuse) that protect the Power Supply from damage caused by overloads or short circuits. Five of the fuses are located on the Regulator Board and have lamps next to them that indicate that they are OK. Lamp out means that the fuse is blown (or the lamp may be defective).

The two heavy-duty cartridge fuses next to the line fuse protect the +28 Volt (F2) and +5 Volt (F3) Circuits. The indicator lamps for these fuses are on the Regulator Board. Refer to Figure 5-5 for "+28V LAMP" and "+5V LAMP".

To remove these two cartridge fuses, remove the power plug from the wall and pull directly outward while holding the middle of the fuse.

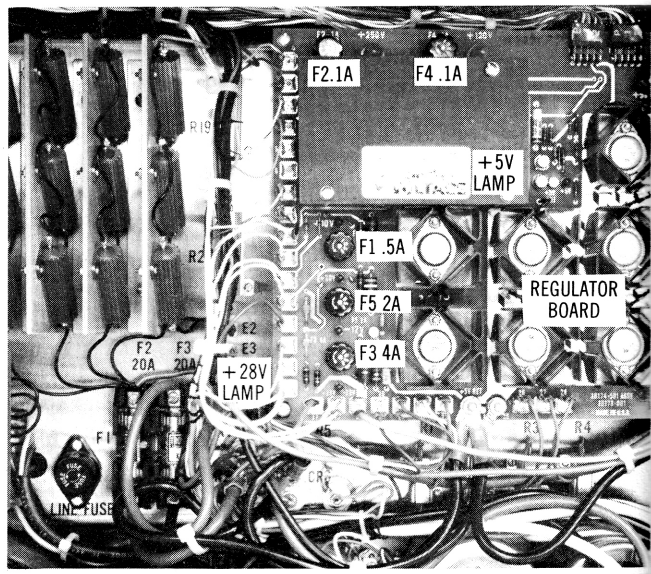


Figure 5-5 Power Supply Fuses

CAUTION

Under no circumstances is it advisable to install a fuse of higher current rating. Refer to Table 5-2 for fuse values.

Table 5-2 Power Supply Fuses

FUSE	AMPS/TYPE	LEVEL	CG NUMBER
F1	0.5A Glass	+10V	53878-001
F2	0.1A Glass	+250V	54025-001
F3	4A Glass	-12V	50432-001
F4	0.1A Glass	+120V	54025-001
F5	2A Glass	+20V	50525-001
F2	20A Cartridge	+28V	54424-013
F3	20A Cartridge	+5V	54424-013

5.3 CONTROL PANEL LAMPS (LED'S)

The indicator lamps on the Control panel such as NO FILM, BUSY and the lens and track indicators are Light-Emitting Diodes (LED's). Any one of the 26 LED's may be replaced as follows:

1— (POWER OFF) Turn the two screw fasteners at the upper corners of the Control Panel and lower the hinged front of the system.
2— Remove the plug from the faulty LED (Figure 5-6) and compress the spring clip with pliers (save the clip).
3— Push the lamp through the front panel opening.
4— Insert the replacement LED, using the original spring clip.
5— Replace the plug (See Note).

NOTE

The LED is polarized. Look for A and B on both the LED and plug. If plugged in backward, LED does not light.

OVERSET, JUST RANGE Lamps

The Overset and Justification Range Lamps are incandescent "C-LIGHTS" and are not polarized, thus may be plugged in either way. The replacement procedure is the same as with LED's.

AMBER—CG No. 57675-002
WHITE—CG No. 57675-001

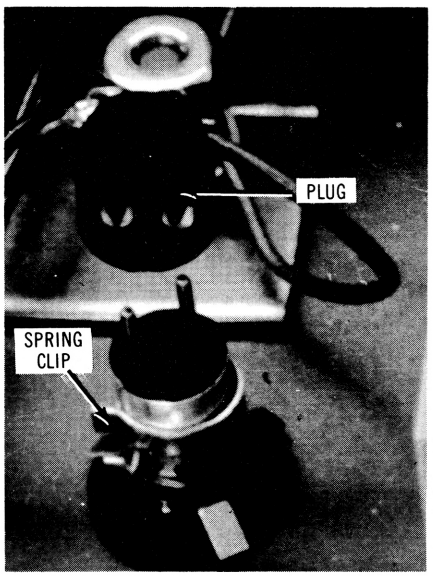


Figure 5-6 Panel Lamp

5.4 EXCITER LAMP (58978-001) REPLACEMENT

The Exciter Lamp may be replaced and focused without detailed alignment if care is taken not to move the assembly (Figure 5-7)

1—Select Track 1, then remove power from wall outlet.
2—Lift Photo Unit cover and remove Film Strips.
3—Remove the safety cover per Paragraph 2.2.

CAUTION

Place hand under Exciter Lamp block whenever loosening or tightening the binding screw.

4—Loosen the binding screw and pull the Exciter Lamp out of the block. Note that both wires are black and that one is connected to pin 5 of Terminal Block 5 (TB5) and the other to pin 6. There is no polarity.
5—Unplug the wires and remove the defective Exciter Lamp. Keep power OFF.
6—Insert the replacement lamp into the block (do not tighten screw).
7—Attach the ends of the Exciter Lamp wires to a 1.5 volt cell. A standard flashlight battery is adequate. Keep power OFF.
8—Rotate lamp for horizontal pattern, etc., per Paragraph 4.2.4, then return to this procedure.
9—Attach the wires of the replacement lamp to TB5, pins 5 and 6.
10—Replace the safety cover (three screws) and the Film Strips.
11—Restore power and check for proper operation.

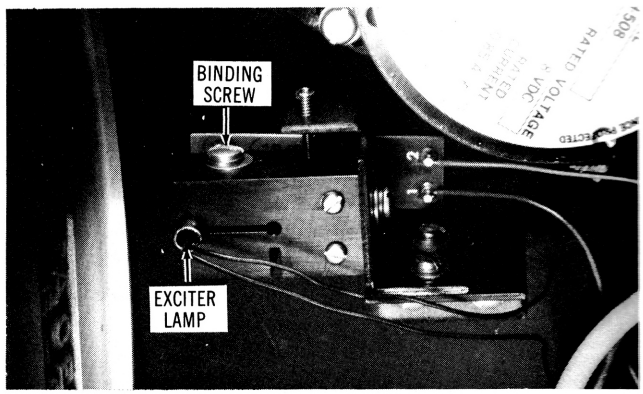


Figure 5-7 Exciter Lamp Replacement

5.5 FLASH LAMP REPLACEMENT

The Flash Lamp inside the flash module may be replaced without realignment if the assembly is not moved during the procedure. After a new Flash Lamp is installed, its higher efficiency may require that the output copy density be adjusted (Paragraph 4.2.1).

CAUTION

Do not contaminate the replacement lamp with fingerprints or oily substances, as this would reduce the efficiency and the life of the lamp.

1— Select Track 4 to move font drum aside, then remove power plug from wall outlet.
2— Remove Film Strips.
3— Remove three screws on the flange of the flash module and carefully remove the lamp (it looks like a small vacuum tube). (See Figure 5-8).
4— Align the pins of the replacement lamp and plug it into the socket. Remove any oily substance with a tissue and solvent.
5— Remount the flash module (three screws) and the Film Strips.
6— Check for correct copy density and adjust if required (Paragraph 4.2.1).

5.6 FONT MOTOR (58860-001) REPLACEMENT

The font drum motor may be replaced without difficulty by following this procedure (Power removed from system).

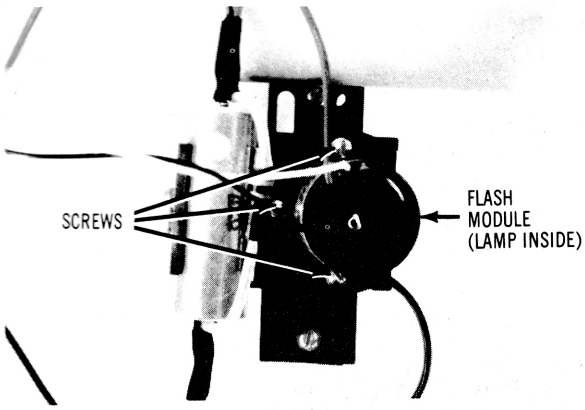


Figure 5-8 Flash Lamp

1— Remove power plug from wall outlet.
2— Remove rear panel of Photo Unit (four screws).
3— Lift the Photo Unit cover and locate the motor. Remove the blue, red and yellow wires by pulling on the quick-disconnects (Figure 5-9).
4— Remove the green ground wire from under the metal can (capacitor).
5— Remove four mounting screws (Figure 5-10) and remove motor and square plate from Photo Unit while slipping belt off pulley.
6— Remove pulley from motor (allen screw) and remove motor from plate (three screws). Mount the plate, then the pulley on the replacement motor.
7— Mount the motor and plate assembly on the photo unit wall (four mounting screws) while slipping the belt onto the pulley.
8— Connect the yellow, red, and blue wires, plus the green wire under the metal can per Figure 5-9. Note that the black and white wires are clamped together.
9— Perform Paragraph 4.2.5 Font Drum Belt Tension.

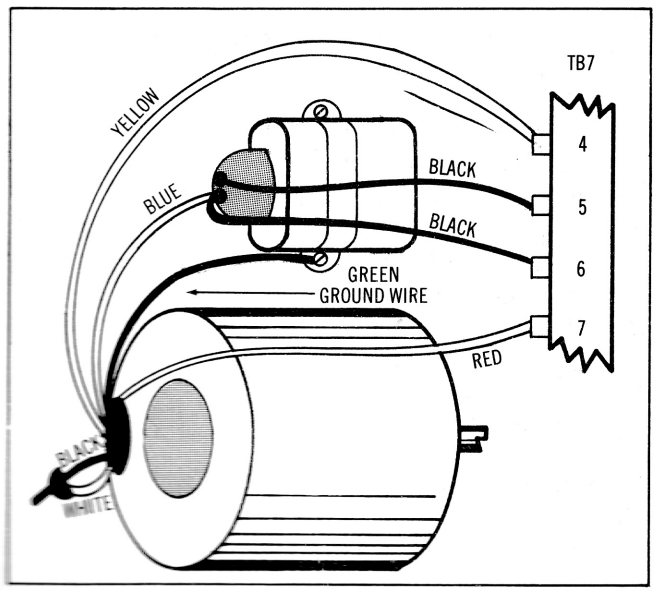


Figure 5-9 Font Motor Wiring.

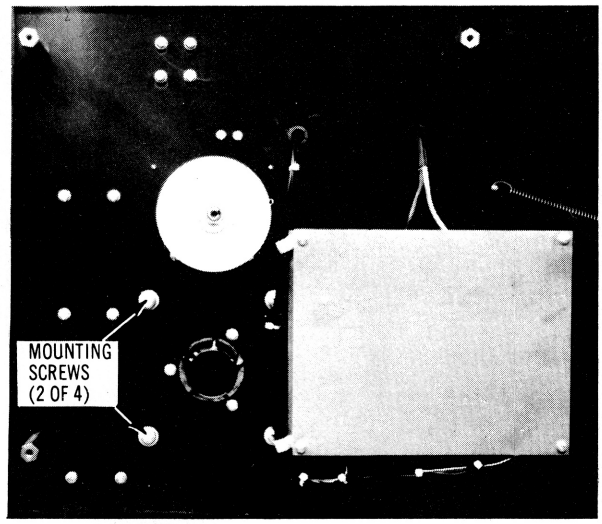


Figure 5-10 Font Drum Motor

5.7 LEADING MOTOR (29022-001) REPLACEMENT

The leading motor may be replaced without difficulty by following this procedure (power removed from system).

1— Remove power plug from wall outlet.
2— Remove top panel of Photo Unit (four screws) and remove six wires from TB4 (Figure 5-11).
3— Remove rear Photo Unit panel (four screws) and shaft end screw (Figure 5-12). Remove pulley.
4— Remove four mounting screws and remove the motor from the Photo Unit. Transfer plate to new motor.

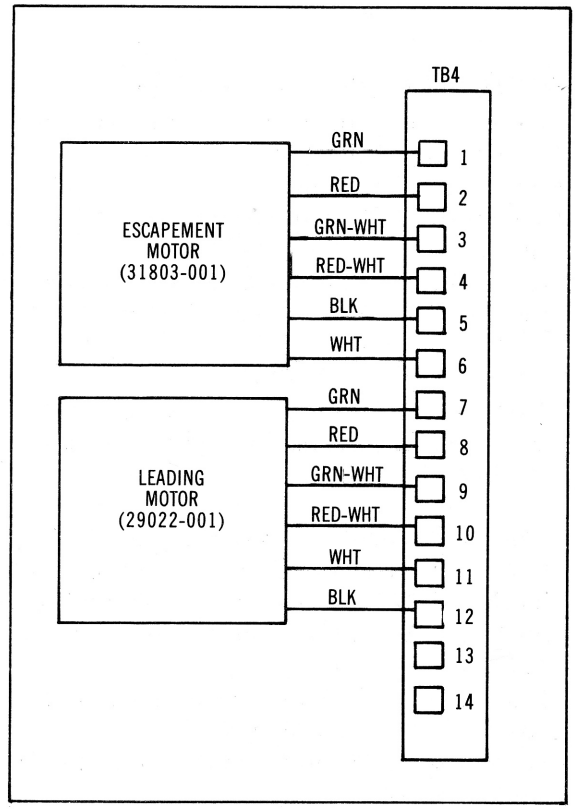


Figure 5-11 Motor Wiring at Terminal Board (TB4)

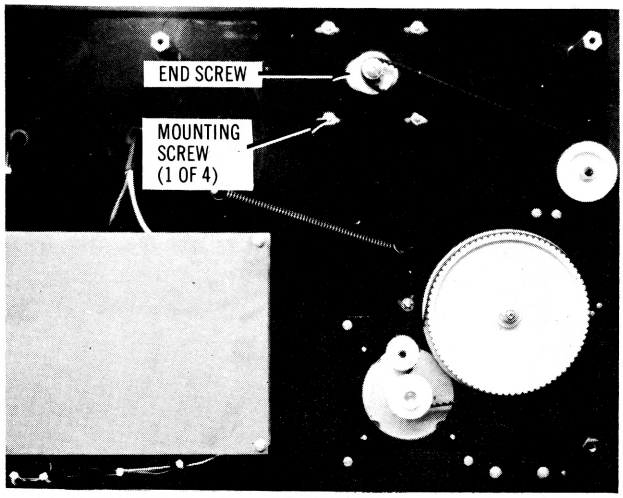


Figure 5-12 Leading Motor (29022-001)

5— Install the replacement motor but do not tighten the mounting screws.
6— Insert the roll pin and install the pulley, engaging the roll pin into the V-groove in the pulley. Fit the belt into the pulleys.
7— Connect the six motor wires to TB4 per Figure 5-11. Dress the wires away fom the lens turret and tie or lace them.
8— Perform 4.2.6 Leading Belt Tension and replace covers.

5.8 ESCAPEMENT MOTOR (31803-001) REPLACEMENT

Replacement of the escapement motor involves more steps than for the other motors, but requires no belt tension adjustment (perform with power removed).

1— Remove power plug from wall outlet.
2— Remove top cover (four screws) and rear Photo Unit cover (four screws).
3— Remove six motor wires from TB4 (Pins 1 thru 6) in the lens turret chamber. See Figure 5-11.
4— Remove idler spring (Figure 5-13) and the end nut on the large pulley. Remove the large pulley for access to one of the motor mounting screws.
5— Remove the roll pin and small pulley from the motor shaft. Keep these for replacement.
6— Remove the internal wire clamp and remove the motor from the system (four mounting screws). Transfer the mounting plate to the replacement motor.
7— Install the replacement motor, large pulley (with end nut), small pulley (with roll pin engaged), idler spring and belt. Tighten the pulleys.
8— Connect the six motor wires to TB4 per Figure 5-11 and dress the wires away from the lens turret and tie or lace them together.
9— Replace the covers. No adjustment is required, as the idler spring sets the proper belt tension.

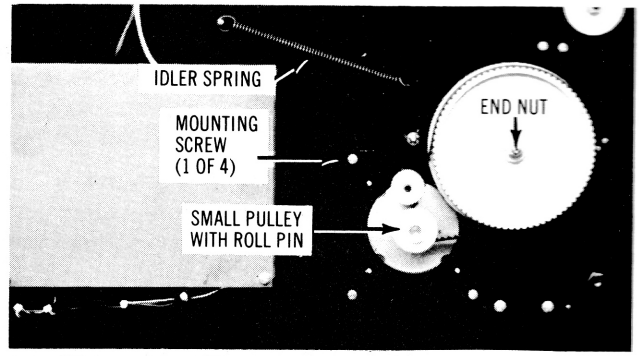


Figure 5-13 Escapement Motor (31803-001)

5.9 TAB/LINE MEASURE DISPLAY REPLACEMENT

The Tab and Line Measure Display consist of two Printed Circuit Boards. The board closest the front panel is the display and the top board is the pull-up Resistor Circuit Board (See Figure 5-14).

1— Remove power cord from wall outlet.
2— Loosen the two fasteners at the top corners of the front panel and lower the hinged panel.
3— Unplug the cable connector from the top Circuit Board and remove the two top screws. Keep the nylon washers as they are important for replacement.
4— If replacing only one board, carefully separate the boards by pulling them straight apart. The pins on the lower board fit into the connectors on the upper board.

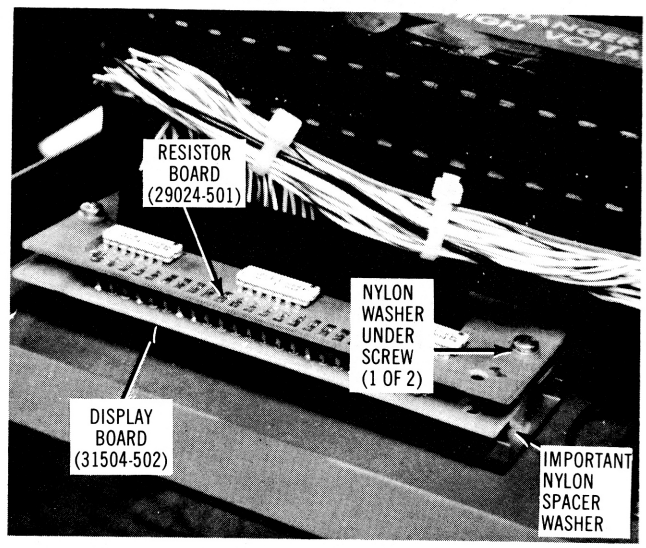


Figure 5-14 Tab/Line Measure Display

5— Fit the replacement board into the remaining original board and mount the assembly onto the posts. Be certain to include the two nylon washers on the top board to prevent cracking the board when tightening the screws.
6— Carefully insert the cable connector. Do not use excessive downward force on the Circuit Boards.

7— Inspect the mating of the two boards and the connector before closing the hinged panel and restoring power.

CAUTION

If for any reason the posts are removed, be certain to include the nylon spacer washer under each post when assembling.

5.10 CHARACTER DISPLAY REPLACEMENT

The Character Display is mechanically simple to replace.

1— Remove power plug from wall outlet.
2— Loosen the two fasteners at the top corners of the front panel and lower the hinged panel.
3— (POWER OFF) Remove the cable connector (Figure 5-15).
4— Remove the plastic cover (three nuts), then loosen four swivel-arm nuts. Rotate the swivel arms to free the assembly.
5— Mount the unit on the panel in reverse order to Step 4. Plug in cable connector.
6— Close the panel and check operation of the display.

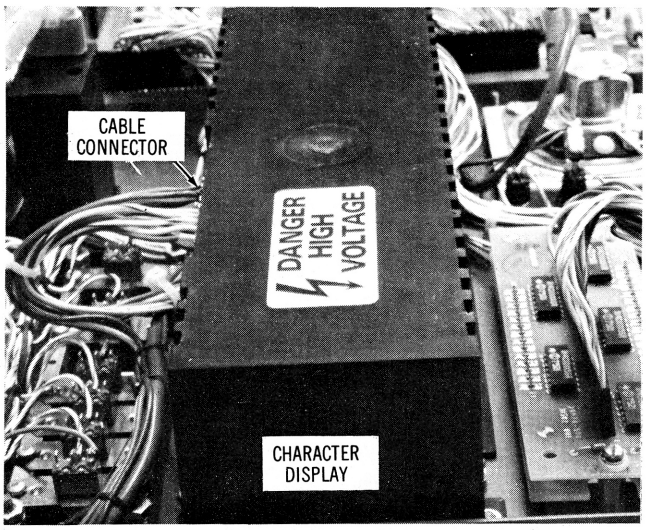


Figure 5-15 Character Display
(Domestic, 57666-001; International, 56144-001)

5.11 LINE COUNTER (53949-002) REPLACEMENT

The Line Counter is very simple to replace. The only precaution is that power be removed during replacement.

1— Remove power plug from wall outlet.
2— Loosen the two fasteners at the top corners of the front panel and lower the hinged panel.
3— Remove the plug from the line counter (Figure 5-16).
4— Remove two mounting screws, nuts and lockwashers and remove the counter.
5— Install the replacement counter in reverse order to Step 4.
6— Connect the plug to the top of the counter.
7— Close the hinged panel and check operation of the counter.

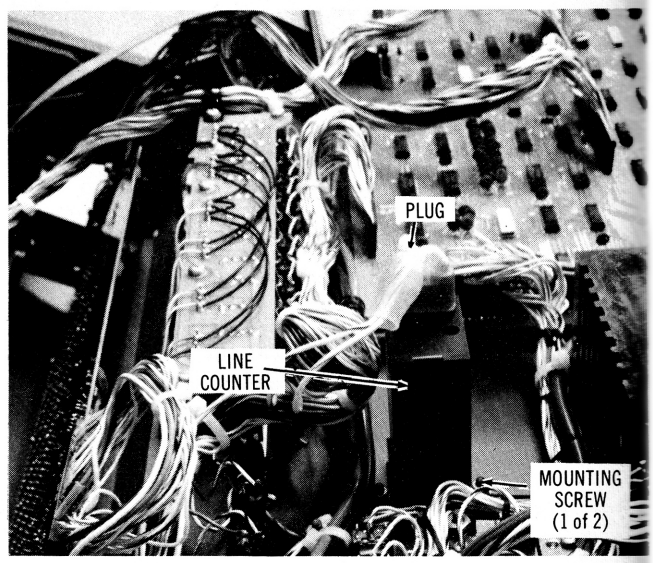


Figure 5-16 Line Counter (53949-002)

5.12 MAIN KEYBOARD (54447-014) REPLACEMENT

The main keyboard is very simple to replace. The only precaution is that power be removed during replacement.

1— Remove the power plug from the wall outlet.
2— Loosen two twist fasteners at the top of the control panel and lower the hinged panel (Refer to Figure 5-17).
3— Unplug P14 from the Printed Circuit Board.
4— Using a 5/16 inch nut driver, remove three nuts on each end of the assembly. Retain the lockwashers for replacement.

NOTE

There are two holes in the bottom of the Control Panel that allow the nut driver to be inserted straight onto the bottom nuts.

5— Remove the keyboard assembly and install replacement keyboard in reverse order to the above.
6— Plug P11 into the replacement Circuit Board.

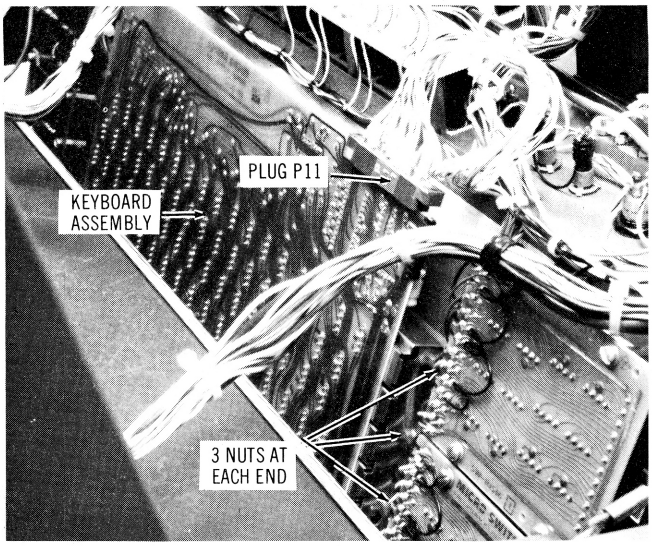


Figure 5-17 Main Keyboard Replacement

5.13 LOGIC BOARDS (CARDS)

The Logic Boards are contained in a rack at the rear of the system. If it is necessary to change a Logic Board, proceed as follows:

1— Remove the power plug from the outlet.

2— Loosen four screws and remove bottom rear panel. The Logic Rack is above the Air Filter (Figure 5-18).

3— To remove a card, place thumbs on the plastic tabs nearest the middle of the card and pry evenly outward.

4— To insert a card, guide the top and bottom of the card into the channels at the appropriate slot until the far end of the card engages the socket. Press steadily inward at the top and bottom until the card seats firmly. The color dotted hinge goes at the bottom.

The individual cards are located in the numbered Slots per Table 5-3

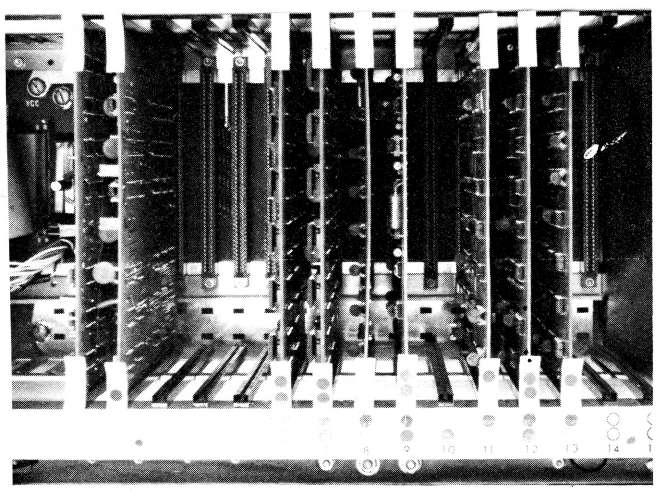


Figure 5-18 Logic Rack (Note slot numbers 1-15)

Table 5-3 Logic Cards

SLOT	DESCRIPTION	CG NUMBER
1	Photo Unit A	36172-501
2	Photo Unit B	35796-501
3	–EMPTY–	–
4	–EMPTY–	–
5	–EMPTY–	–
6	Program Card (2K x 12)	36802-502
7	Program Card (2K x 12)	36802-503
8	Data RAM	34044-502
9	Processor Interface	37794-501
10	–EMPTY–	–
11	CPU A	34325-501
12	CPU B	34319-501
13	CPU C	34305-501
14	EMPTY (Used for Test Panel)	–
15	–EMPTY–	–

CAUTION

The cards in Slots 6 and 7 (36802-502 and 36802-503) are NOT interchangeable.

5.14 KEYBOARD INTERFACE BOARD (36039-501)

The Keyboard Interface is the large board behind the Control Panel. If replacing this board, care must be taken to return the plugs and wires to the proper locations. Refer to Figure 5-19.

1— Remove the power plug from the wall.

2— Loosen the two screw fasteners at the top of the Control Panel and lower the hinged panel. The Keyboard Interface Board should appear as in Figure 5-19.

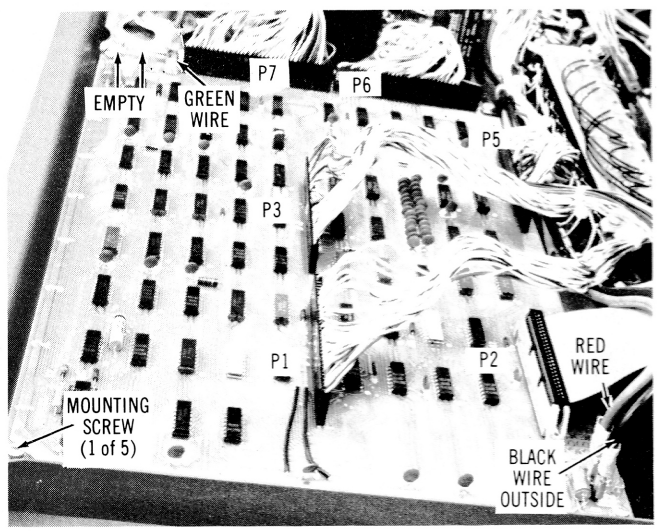


Figure 5-19 Keyboard Interface Board

3— Observe that the plugs (P1, P2, P3, P5, P6, P7) are identified and that the pin numbers on the plugs match the key numbers on the Circuit Board. These conditions must be met when the new board is installed.
4— Remove the plugs using both hands, pulling evenly upward. Remove the three wires (red, black, green) pulling the plugs off the terminals.
5— Remove the five screws, one in each corner and one at the edge between J2 and J5.

CAUTION

Do not try to lift the board until all five screws have been removed, as cracking of the board could result.

6— Install the replacement board (five screws) and insert the plugs and wires. Consult Step 3 and Figure 5-19.
7— Close the Control Panel, restore power and check system function.

5.15 HIGH VOLTAGE FLASH BOARD (32590-501)

The HV Flash Board is located behind the Control Panel in a protective cage. See Figure 1-4 if identification is required.

1— Remove the power plug from the wall.
2— Loosen two screws at the top of the Control Panel and lower the hinged panel.
3— Remove four screws and remove the cage. The assembly should appear as in Figure 5-20.
4— Carefully pull the wires off the terminals. The black jumper wire on terminals 6 and 10 must be used on the new board at the same location.

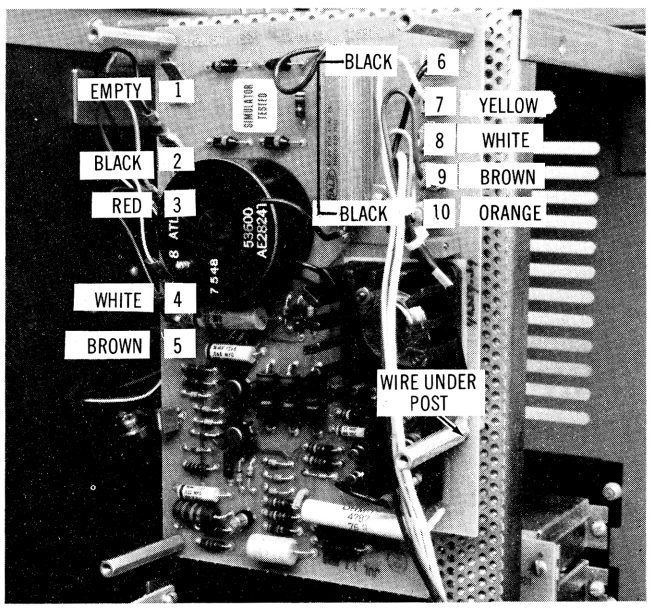


Figure 5-20 High Voltage Flash Board

5— Remove the four posts by turning them counter-clockwise. Note the wire under one post. It must be returned to this location on the new board. Remove the board.
6— Install the new board, placing the wire under the post and the black jumper wire on terminal 6 and 10.
7— Plug the colored wires onto the remaining terminals per Figure 5-20. Seat them firmly.
8— Replace the cage (four screws) with the grommet hole towards the front panel.
9— Close the Control Panel, restore power and check output copy (Refer to 4.2.1.).

5.16 MOTOR CONTROL BOARD (36032-501)

The Motor Control Board is located on the rear of the system. This board controls the lens and track select motors (Figure 5-21).

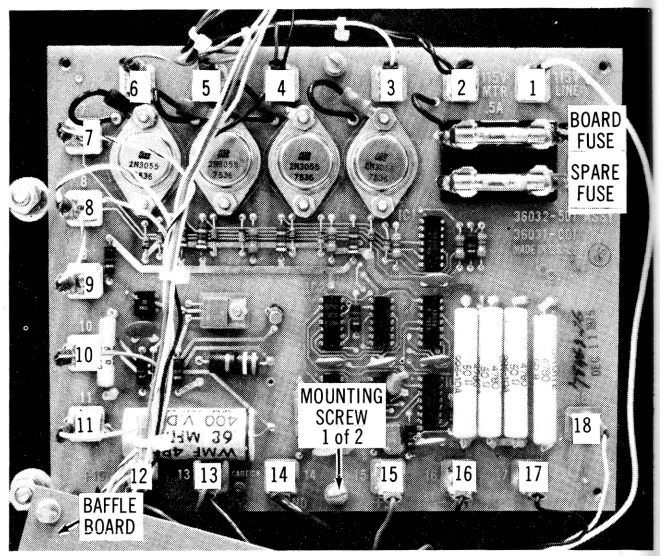


Figure 5-21 Motor Control Board (Table 5-4)

FUSE—There is a .5A fuse on this board, with a spare mounted under it (CG No. 52904-001). Before changing the board, make certain that the problem is not a blown fuse (Paragraph 5.2.3).

1— Remove the power plug from the wall.
2— Remove the rear (upper) panel (four screws).
3— Remove the baffle board (four screws, washers and aluminum spacers). The Motor Control Board should now appear as in Figure 5-21.
4— Check the top fuse. If it is blown, replace it and check system function. If it blows again, replace the board.
5— To replace the board, unplug the colored wires from the terminals one by one, plugging them into the same location on the new board. Table 5-4 shows the colors and terminals.

Table 5-4 Motor Control Board Wiring

TERMINAL	COLOR(S)	REMARKS
1	White	Long, heavy wire.
2	Black (2)	Two black wires (115 VAC).
3	Wht-Red	–
4	Red	–
5	Green	–
6	Wht-Grn	–
7	Wht-Blk	–
8	Wht-Brn	–
9	Wht-Red	–
10	Blue	–
11	Yellow	–
12	Violet	–
13	Blk-Gray	Two wires.
14	Black	Heavy ground wire.
15	Blue	–
16	Brown*	*May be black, see below.
17	Black	Slightly heavier black wire.
18	White	Short, slim white wire.
*Caution: Earlier models had slim black wire.		

6— After all wires are transferred and mated snugly, remove the old board (two mounting screws), and mount the new one. The washers should be under the heads of the screws and care should be taken not to crack the board by tightening too much.

7— Ensure that there is a fuse in the new board then replace the baffle board and aluminim spacers (four long screws with washers).

8— Replace the rear panel (four screws) and restore power. Check system for proper function.

5.17 MOTOR DRIVER BOARD (35683-501)

The Motor Driver Board is located behind the Control Panel in a protective cage. This board has circuitry which controls or drives the following assemblies:

- Exciter Lamp, Photocell
- Track Select Solenoid
- Leading Motor
- Escape Motor

To replace the Motor Driver Board:

1— Remove the power plug from the wall.

2— Loosen two screw fasteners and lower the hinged Control Panel.

3— Remove the protective cage (Figure 1-4) (four screws). The Motor Driver Board should now appear as in Figure 5-22.

4— Hold the new board close to the mounted board and transfer the wire-plugs one-by-one to the new board. These plugs may be mated firmly after the new board is mounted.

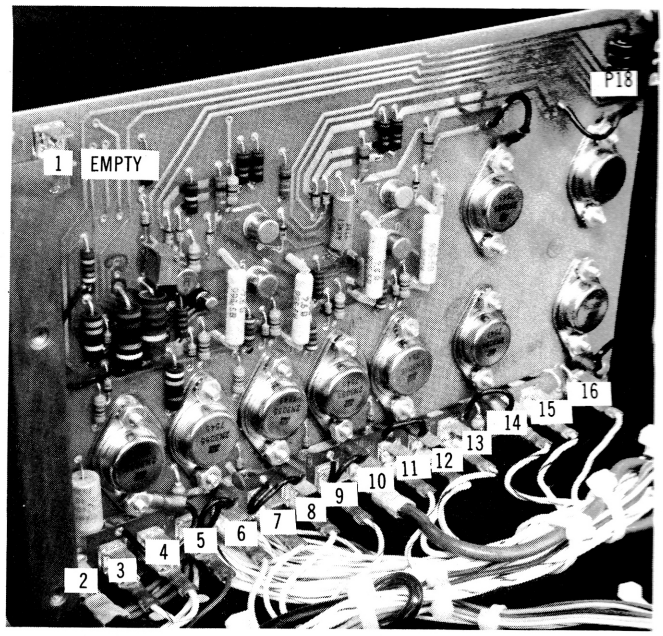


Figure 5-22 Motor Driver Board (Table 5-5)

5— Unplug P18 and remove four screws and washers from the corners of the board. Remove the old board and mount the new one, placing the washers under the screw heads. Tighten the screws snugly but do not over tighten, as this may crack the board.

6— Plug P18 into the new board, and mate the wire-plugs to the terminals firmly. Place hand behind board to prevent cracking the board.

7— Check the wire colors and terminal per Table 5-5 before proceeding.

Table 5-5 Motor Driver Board Wiring

TERMINAL	COLOR(S)	REMARKS
1		Empty—not used.
2	Black	Heavy wire.
3	Wht-Grn	–
4	Wht-Brn	–
5	Violet	–
6	Yellow	–
7	Wht-Blk-Yel*	*May be thin white-yellow.
8	Wht-Yel	Heavier wire than on #7
9	Wht-Blue	–
10	Red	Heavy wire
11	Wht-Vio	–
12	Wht-Orn	–
13	Wht-Blk-Red	–
14	Wht-Blk-Brn.	–
15	Wht-Blk-Orn	–
16	Wht-Gray	–
*Caution: Earlier models used thin white-yellow wire.		

8— Replace cage, close panel and check system for proper function.

COMPUWRITER IV, UNIVERSAL IV
PARTS CATALOG

SERIAL NUMBERS 2000 AND ABOVE

INDEX

Description	Page
Instructions For Ordering	2

(TO BE SUPPLIED AT A LATER DATE)

Field Service Publications
325-694 REV 0
May 1976

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compugraphic
80 Industrial Way, Wilmington, Massachusetts 01887 / (617) 944-6555

INSTRUCTIONS FOR ORDERING

To order a part whether by phone, teletype, or mail, specify the following:

- Compugraphic part number and description of part. For IC chips, include board number and chip location.
- Quantity of each item being ordered.
- Model number of unit for which part is being ordered.
- Serial number of unit for which part is being ordered.
- Corporate name of firm.
- Shipping Address of firm, including ZIP code.
- Full name of person ordering part(s).
- To whose attention the part(s) should be sent.
- Customer purchase order number, if any.
- Any specific shipping methods required by customer.

ORDERS, U.S. AND CANADA

To order replacement parts, with the exception of fonts, width plugs, width cards, keyboard PROM cards, set gears, or pulleys, address orders to

COMPUGRAPHIC CORPORATION
ATT: SERVICE PARTS DEPT.
23 INDUSTRIAL WAY
WILMINGTON, MA 01887
TELEPHONE (617) 658-5008

To order fonts, width plugs, width cards, keyboard PROM cards, set gears, or pulleys contact your Regional Sales Office or:

COMPUGRAPHIC CORPORATION
ATT: TYPE DIVISION
66 CONCORD ST.
WILMINGTON, MA 01887
TELEPHONE (617) 944-6555

For rapid service on fonts and associated hardware customers can use Telefont by calling (617) 944-6555 exts. 460 or 652. There is a 20% surcharge on Telefont orders.

ORDERS OUTSIDE U.S. AND CANADA

Address orders to dealer where the equipment was purchased.

INSTRUCTIONS FOR RETURNING DEFECTIVE PARTS

RETURNS, U.S. AND CANADA

To return defective parts other than fonts, width plugs, width cards, keyboard PROM cards, set gears or pulleys, proceed as follows:

- Package each part with a completed Returned Goods Credit/Replacement Request form or a letter explaining why the part is being returned and the action Compugraphic is expected to take. Be sure to identify Model and Serial No. of equipment from which the defective part was removed (particularly necessary for warranty items). Also, include the following address information:
  - —Corporate name of equipment owner
  - —Shipping address of firm returning the part
  - —To whose attention a replacement part is to be sent
- Send part with requested information **prepaid** to:

COMPUGRAPHIC CORPORATION
ATT: SERVICE RETURNED GOODS DEPARTMENT
23 INDUSTRIAL WAY
WILMINGTON, MA 01887
TELEPHONE (617)-944-6555 EXT. 332

To return fonts, width plugs, width cards, keyboard PROM cards, set gears or pulleys, proceed as follows:

- Before returning item, contact Type Division Returned Goods Department either by letter or phone (see address and phone number below) describing the problem with the part and requesting instructions. This step is important as it will provide the quickest resolution of a type problem.
- When instructions are received to return an item, proceed as instructed being sure to include all requested information, samples of copy, etc.
- Address inquiries and return of type parts to:

COMPUGRAPHIC CORPORATION
ATT: TYPE DIVISION RETURNED GOODS DEPARTMENT
66 CONCORD STREET
WILMINGTON, MA 01887
TELEPHONE (617) 944-6555 EXT. 470

RETURNS OUTSIDE U.S. AND CANADA

For returns outside U.S. and Canada, contact dealer where equipment was purchased.

compugraphic
Service Parts Dept.
23 Industrial Way
Wilmington, MA 01887

PARTS ORDER

SO-

DATE / /	☐ CHARGE	☐ WARRANTY	P.O. NO.
TERMS CODE		DISTRICT ORDER NUMBER	— —

SHIP TO:	CUSTOMER CODE	BILL TO:	CUSTOMER CODE

DESCRIPTION	ACCT. CODE	PART NUMBER		QTY.	UNIT PRICE	BILL CODE	MESSAGE CODES	

REMARKS:	WRITE IN MESSAGE:

SYSTEM	ORDER CODE	BILLING CODE	SHIP VIA CODE
MODEL NO.	☐ PRIORITY 1	☐ CHARGE	
SERIAL NO.	☐ PRIORITY 2	☐ CHARGE & CREDIT	SPECIAL INSTRUCTIONS:
INSTALLATION DATE	☐ PRIORITY 3	☐ NO CHARGE REASON N/C	
	☐ OTHER SEE REMARKS		☐ SERVICE ENG. REPLACEMENT

ORIGINATED BY:	RECEIVED BY:	APPROVED BY:	PROCESSED BY:

- PLEASE COMPLETE ALL SHADED AREAS.
- THIS FORM SHOULD NOT BE USED TO ORDER PHOTOGRAPHIC SUPPLIES OR TYPOGRAPHIC ITEMS.
- FOR U.S. AND CANADIAN USE ONLY.

325-478 1/77 REV 1

COMPUWRITER IV/UNIVERSAL IV
Series IV, 48, 88
(Serial Numbers 2000 and Above)
INSTALLATION CHECKLIST

INSTRUCTIONS

This checklist should be followed each time equipment is installed. Note and explain any deviation from these instructions both on the checklist and on the Installation Report.

For additional information in performing any check, refer to the Technical Manual, Applications Manual, logic and schematics, and other documents such as FEAT's as may be necessary.

This checklist is complete only when the following items on the last page have been filled in:

System Serial Number
Installation Date
Service Representative's Signature
Service Representative's Employee Number
Customer's Signature and Date Signed

After completion, the checklist is left with the customer with the exception of the last page which should be returned to the appropriate District Service Office.

POWER OFF

☐ 1. Check AC receptacle for proper ground. Ensure that the line is isolated and at proper voltage level.

☐ 2. Visually check system for any damage. Inform the customer of any damage incurred in shipment so a claim may be initiated with the carrier.

☐ 3. Check invoice for parts shipped versus parts received. Record all back-ordered and missing items from shipment.

☐ 4. Check all fuses for proper value (Section V Customers Maintenance Manual).

☐ 5. Visually check the Logic Rack for broken or frayed wires and loose IC Chips.

☐ 6. Check all connectors to be sure that good contacts are made.

☐ 7. Check terminals on large electrolytic capacitor for tightness (System Power Supply).

8. Check for tight lenses and lead screw.

9. Check font drum, leading and escapement belts for correct tension. Check pulley for tightness. Adjust if necessary. Refer to Section VII of Technical Manual.

10. Check filter, replace or clean if necessary.

11. Mount Film Strips and manually rotate font drum to check for clearance between the film and the pickup assembly.

12. Install proper Width Cards; seat firmly.

13. Check for proper Keyboard PROM Card.

POWER ON

☐ 1. Turn POWER ON, press PRIME and check fans for operation.

☐ 2. Check the font clock pulses for 75% duty cycle.

☐ 3. Press CONTINUOUS LEADING button and observe that approximately three inches of film are leaded.

☐ 4. Check operation of Lens Select and Lens LED indicators.

☐ 5. Check operation of Track Select and Type Face LED indicators.

☐ 6. Set LINE MEASURE of 45 picas and check CHARACTER DISPLAY by keying alphabet in Lower Case, all other flashable characters in Upper and Lower Case, all function keys of main keyboard and auxiliary keys.

☐ 7. Check all flashable characters in all typefaces, including Super Shift, with LINE MEASURE set at 45 picas, Point Size 18, LEADING 20.

☐ 8. Check Quad Left, Quad Center and Quad Right functions.

☐ 9. Check Insert Space function.

☐ 10. Check SB MIN switches with Quad Left lines.

☐ 11. Check SB MAX switches.

☐ 12. Check programmed Character Compensation.

☐ 13. Check programmed Leading function.

☐ 14. Check TR (Tab Repeat) function.

☐ 15. Check Cancel Character, Cancel Word and Cancel Line functions.

☐ 16. Check for proper function of Justification Range, Overset, Calculate Line and Line Display.

☐ 17. Check for in-line mixing of all Point Sizes and typefaces.

☐ 18. Check operation of Insert Leader and Rule with text and Insert Space lines.

☐ 19. Run Diagnostic Keyboarding Test per Section III of the Customers Maintenance Manual to check those functions not covered above.

☐ 20. Check Interlens Column Alignment per Section VIII of the Technical Manual.

☐ 21. Check Interlens Baseline Alignment per Section VIII of the Technical Manual.

CUSTOMER INSTRUCTION

1. Show and explain the operation and use of the following Controls and Indicators. Refer your explanation to the Applications Manual.

   ☐ A. Internal Controls
   1. SpaceBand MINimum switches
   2. SpaceBand EXPand switches
   3. REPEAT LINE switch
   4. REPEAT FLSH switch
   5. JR AUDIO switch
   6. RAGged RIGHT switch
   7. HYPHEN switch

   ☐ B. Control Panel
   1. POWER ON/OFF switch
   2. PRIME button
   3. CONTINUOUS LEADING button
   4. LINE COUNTER indicator
   5. LINE DISPLAY button
   6. NO FILM lamp
   7. BUSY lamp
   8. SHIFT lamp
   9. LEADING switches
   10. CHARACTER COMPENSATION switches
   11. AUTO LINE END switch
   12. LETTERSPACE switch
   13. TAB indicator
   14. LINE MEASURE display
   15. OVERSET lamp
   16. JUSTIFICATION RANGE lamp

2. Show and explain the procedures and functions listed below. Refer your instruction to the Applications Manual:

   ☐ A. Keyboard Procedure and Functions
   1. Straight matter
   2. Lens Change
   3. Face Change
   4. Flush Left, Right and Center lines
   5. CALC LINE
   6. FWD and BACK ONE POINT
   7. FWD and BACK ONE UNIT
   8. Multiple Justification
   9. CNCL CHAR, WORD and LINE
   10. NON PHOTO
   11. FLASH ONLY
   12. Repeat Characters
   13. SUPER SHIFT function
   14. TAB
   15. Error Signals

   ☐ B. Demonstrate how to change Width Cards and Keyboard PROM Card.

   ☐ C. Demonstrate proper installation of Film Strips. Be sure to tell operator to rotate the font wheel slowly after the Film Strip is installed to make sure the Film Strip is not hitting anything.

   ☐ D. Demonstrate how to load film. Check NO FILM light. Explaing the use of the CONTINUOUS LEADING button.

CUSTOMER MAINTENANCE

1. Cover the maintenance items below with the person who will be maintaining the equipment.

   ☐ A. Affix the Preventive Maintenance Schedule to the outside rear panel of Photo Unit.

   ☐ B. Perform the maintenance listed on the schedule, explaining each item as you proceed.

   ☐ C. Demonstrate how to clean the lenses and other optics.

   ☐ D. Demonstrate how to clean and store Film Strips. Use CG Font and Film Cleaner part number 56996.

   ☐ E. Indicate what to look for in the Exciter Lamp area:
   1. Where the mask is.
   2. Shape of light on Photocell mask slit.
   3. How to change the Exciter Lamp and adjust it properly.

2. Instruct customer on procedure for ordering parts.

   ☐ A. Film Strips, Width Cards and paper

film are ordered through District Office.

SPARE PARTS KIT TESTING

☐ 1. Check inventory of parts kit against parts list enclosed in Spare Parts Kit. Record and report any missing items and back-ordered items.

☐ 2. Check operation of all spare boards in Spare Parts Kit if appropriate.

INSTALLATION CHECKLIST

Signature Page

☐ Customers Maintenance Manual Present ☐ Applications Manual Present

If above blocks are not checked, indicate action taken to obtain manuals:

_____

_____

Name(s) of Customer Operating Personnel Trained

_____ No. Hours_____

_____ No. Hours_____

Name(s) of Customer Maintenance Personnel Trained

_____ No. Hours_____

_____ No. Hours_____

Customer has Spare Parts Kit ☐ Yes ☐ No
Customer has ordered Spare Parts Kit ☐ Yes ☐ No

The Compugraphic Service Engineer has performed the checks and has given the instructions listed in the equipment Installation Checklist.

I (do) (do not) want to utilize Phone Consultation Service at following indicated level:
☐ Operator Correctable Problem
☐ Maintenance/Equipment Problem Analysis

CUSTOMER SIGNATURE	DATE
CUSTOMER NAME	EQUIPMENT TYPE
ADDRESS	SERIAL NUMBER
CITY & STATE ZIP	INSTALLATION DATE

I have performed the checks and given the appropriate instructions listed in the equipment Installation Checklist as indicated by the boxes checked off and agreed to by the customer.

SERVICE ENGINEER SIGNATURE	DATE
SE EMPL. NUMBER	

COMPUWRITER IV/UNIVERSAL IV

PREVENTIVE MAINTENANCE SCHEDULE

SERIAL NUMBERS 2000 AND ABOVE

–INSTRUCTIONS–

WARNING: REMOVE PLUG FROM WALL OUTLET WHEN PERFORMING PREVENTIVE MAINTENANCE

–WEEKLY–

FILTER–Remove and vacuum both dust filters. Replace large filter every six months or more often as needed.

JAN	FEB	MAR	APR	MAY	JUN
☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐

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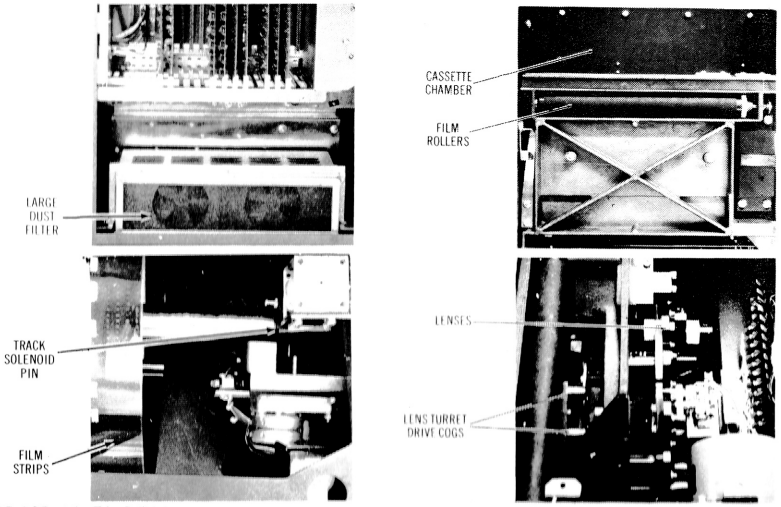
CASSETTE AND FILM ROLLERS–Remove bits of paper and dust from cassette and film rollers.

–TWO MONTHS–

TRACK SOLENOID PIN AND SUPPORT BEARINGS–Lubricate solenoid pin, track selector rack and arm with CG53341 grease. Lubricate support bearing with CG53340 oil.
LENS TURRET DRIVE COGS–Lubricate drive cogs with CG53341 grease.

–AS REQUIRED–

FILM STRIPS–Clean Film Strips with Font and Film Cleaner CG56996 and a soft, lint-free cloth.
LENS–Clean lenses with tissue moistened with alcohol (90% or better).
OPTICAL MIRROR–Clean mirror surfaces per Section II of Customer Maintenance Manual.
EQUIPMENT EXTERIOR–Wipe exterior of equipment with solution of water and mild detergent.
KEYBOARDS–Vacuum clean keytop areas with soft brush attachment.



COMPUWRITER IV/UNIVERSAL IV

PREVENTIVE MAINTENANCE SCHEDULE

SERIAL NUMBERS 2000 AND ABOVE

–INSTRUCTIONS–

WARNING: REMOVE PLUG FROM WALL OUTLET WHEN PERFORMING PREVENTIVE MAINTENANCE

–WEEKLY–

FILTER–Remove and vacuum both dust filters. Replace large filter every six months or more often as needed.

JAN	FEB	MAR	APR	MAY	JUN
☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐

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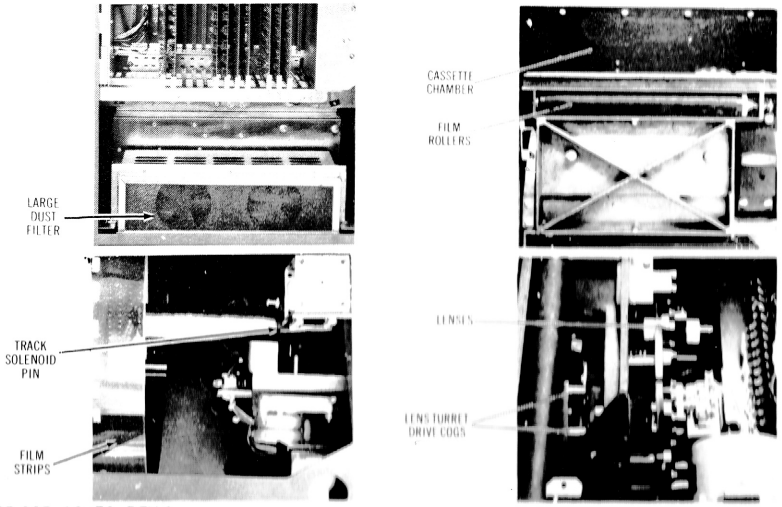
CASSETTE AND FILM ROLLERS–Remove bits of paper and dust from cassette and film rollers.

–TWO MONTHS–

TRACK SOLENOID PIN AND SUPPORT BEARINGS–Lubricate solenoid pin, track selector rack and arm with CG53341 grease. Lubricate support bearing with CG53340 oil.
LENS TURRET DRIVE COGS–Lubricate drive cogs with CG53341 grease.

–AS REQUIRED–

FILM STRIPS–Clean Film Strips with Font and Film Cleaner CG56996 and a soft, lint-free cloth.
LENS–Clean lenses with tissue moistened with alcohol (90% or better).
OPTICAL MIRROR–Clean mirror surfaces per Section II of Customer Maintenance Manual.
EQUIPMENT EXTERIOR–Wipe exterior of equipment with solution of water and mild detergent.
KEYBOARDS–Vacuum clean keytop areas with soft brush attachment.



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